

JVC

SERVICE MANUAL

EDITING CONTROL UNIT

RM-G810U



SPECIFICATIONS

Power source : DC 12 V \equiv
Power consumption : 6.6 W
Operating temperature range : 5°C to 40°C
Dimensions : 430(W) x 118(H) x 322(D) mm
Weight : 6.0 kg (13.3 lbs)

VCR controls

Control buttons : PLAY, REC, FF, REW, STOP, PAUSE/STILL, SEARCH, JOG
Dial search : Continuously variable depending on the player and recorder models used.
Jog dial : Provided

Editing controls

Edit modes : Assemble and Insert
Edit-point memory : Edit-in and edit-out points held in memory (preview, perform and review possible)

Edit-point shift : Possible by frame in both directions
Editing accuracy : Within ± 2 frames
Preroll time : Selectable 3 sec, 5 sec, 7 sec, 10 sec

Counter display

Time counter : Up to 9 hours, 59 minutes, 59 seconds, 29/24 frames
Display : Total time/elapsed time of an edit/edit-in and edit-out points/edit duration
Display medium : LED

Accessories

Remote control cable x 2 (5 m/16 ft)

Design and specifications subject to change without notice.

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the  symbol and shaded (■) parts are critical for safety.

Replace only with specified part numbers.

Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.

Caution for continued protection against fire hazard.

Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:

- 1) Wires covered with PVC tubing
- 2) Double insulated wires
- 3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:

- | | | |
|--------------------|--------------------------------------|------------|
| 1) Insulation Tape | 3) Spacers | 5) Barrier |
| 2) PVC tubing | 4) Insulation sheets for transistors | |

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

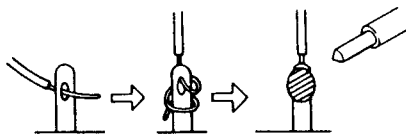


Fig. 1

7. Observe that wires do not contact heat producing parts (heat-sinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

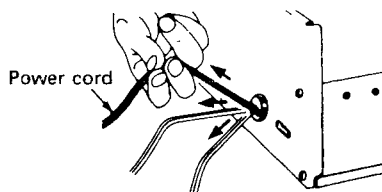


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)

In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

1) **Connector part number** : E03830-001

2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.

3) **Replacement procedure**

(1) Remove the old connector by cutting the wires at a point close to the connector.

Important : Do not reuse a connector (discard it).

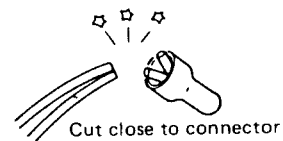


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

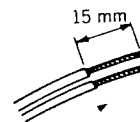


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

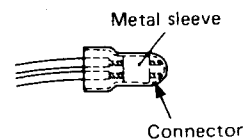


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

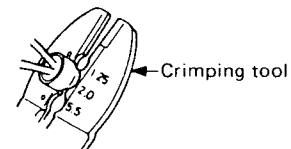


Fig. 6

(5) Check the four points noted in Fig. 7.

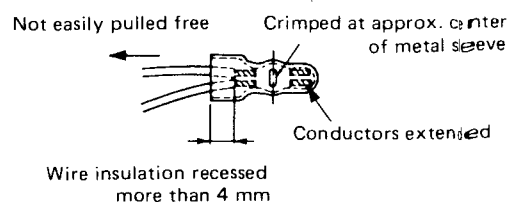


Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

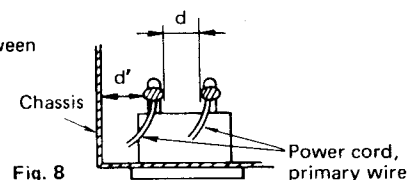
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

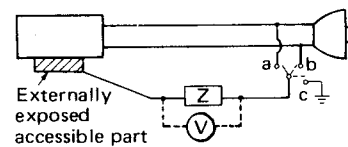


4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

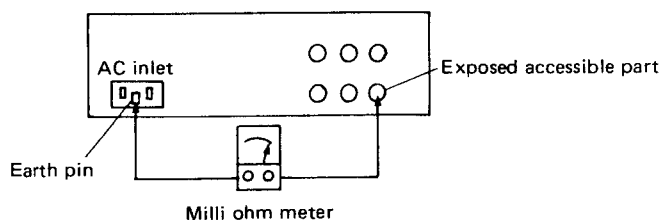


5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.



Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	$R \geq 1 \text{ M}\Omega / 500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3 \text{ mm}$
100 to 240 V			AC 1.5 kV 1 minute	$d, d' \geq 4 \text{ mm}$
110 to 130 V	USA & Canada	—	AC 900 V 1 minute	$d, d' \geq 3.2 \text{ mm}$
110 to 130 V	Europe & Australia	$R \geq 10 \text{ M}\Omega / 500 \text{ V DC}$	AC 3 kV 1 minute (Class II)	$d \geq 4 \text{ mm}$
200 to 240 V			AC 1.5 kV 1 minute (Class I)	$d' \geq 8 \text{ mm (Power cord)}$ $d' \geq 6 \text{ mm (Primary wire)}$

Table 1 Specifications for each region

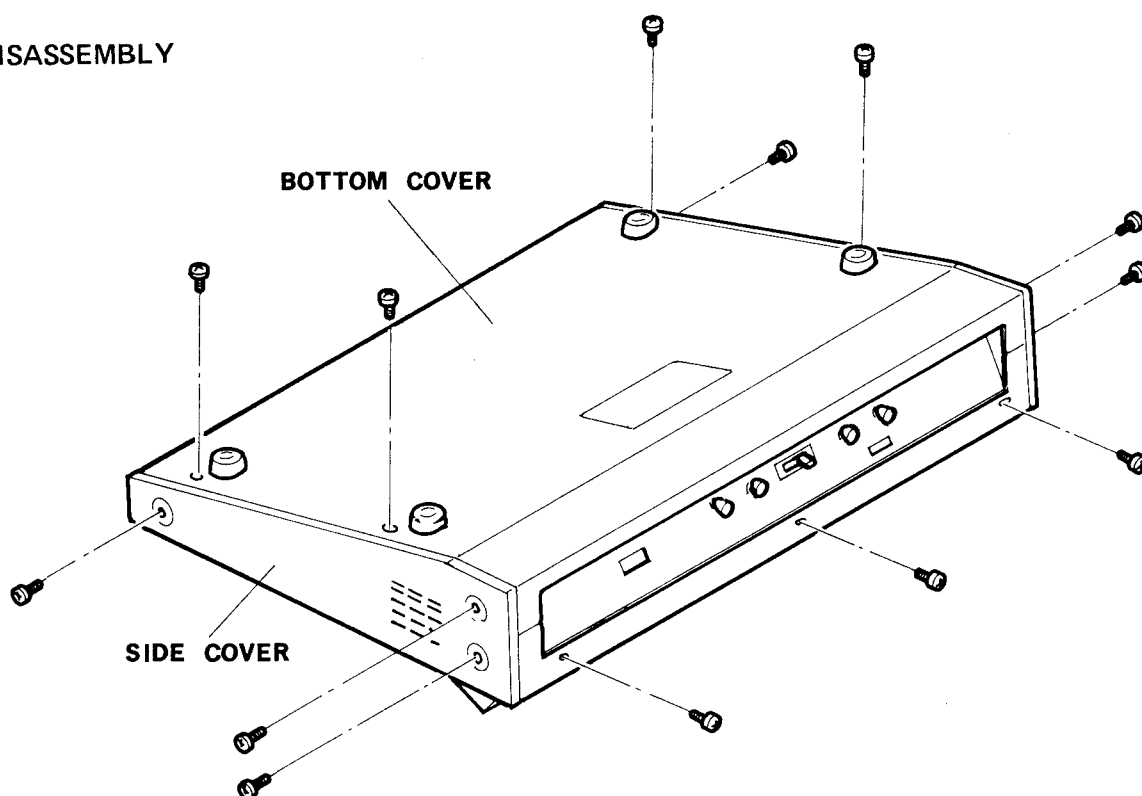
AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	$1 \text{ k}\Omega$	$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	USA & Canada	$0.15 \mu\text{F}$ capacitor in parallel with $1.5 \text{ k}\Omega$	$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	Europe & Australia	$2 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna earth terminals
220 to 240 V		$50 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

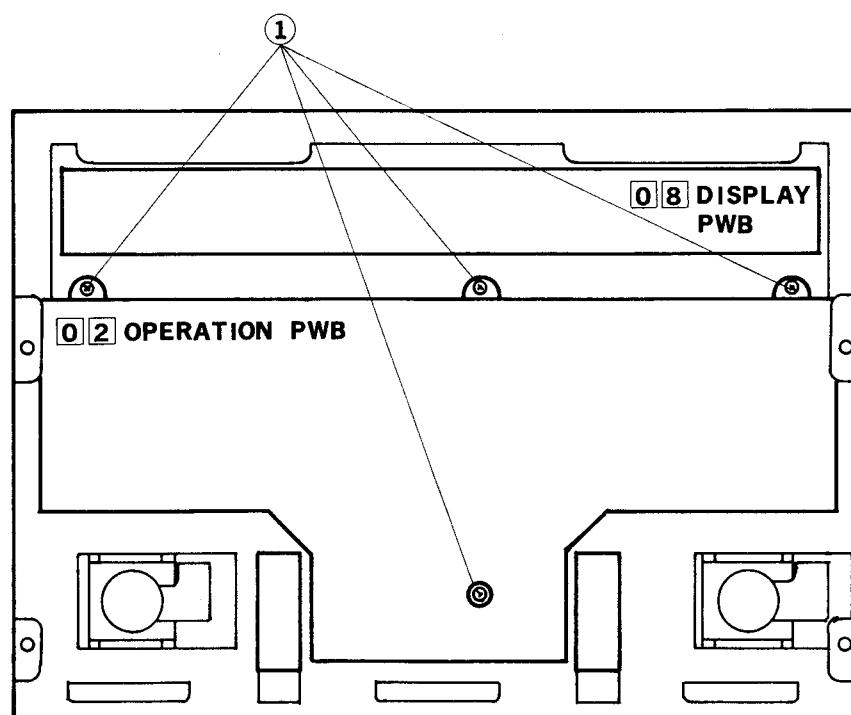
Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

SECTION 1 GENERAL DESCRIPTION

1.1 DISASSEMBLY



Take out the screws indicated in the figure to remove the bottom cover.



Remove the search and jog knobs (see next Section), slide knobs and take out 4 screws ① to separate the top cover and main chassis.

1.2 SEARCH/JOG KNOBS AND CONTROL ASSEMBLY

1. Position the search/jog knob as indicated in Fig. 1.
2. Remove tire ①. Refer to Fig. 2.
3. Insert a metric hex wrench (1.5 mm) into hole A and loosen the setscrew. Remove the jog knob ②.
4. Take out 3 screws ③ and remove the search knob ④.
5. Take out 4 screws ⑤ and remove the search/jog control assembly.

Note: Do not remove the jog board from the search/jog control assembly. Since adjustment requires a special fixture, the board is not replaced separately.

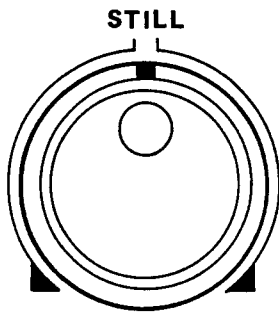


Fig. 1 Search/jog knobs position

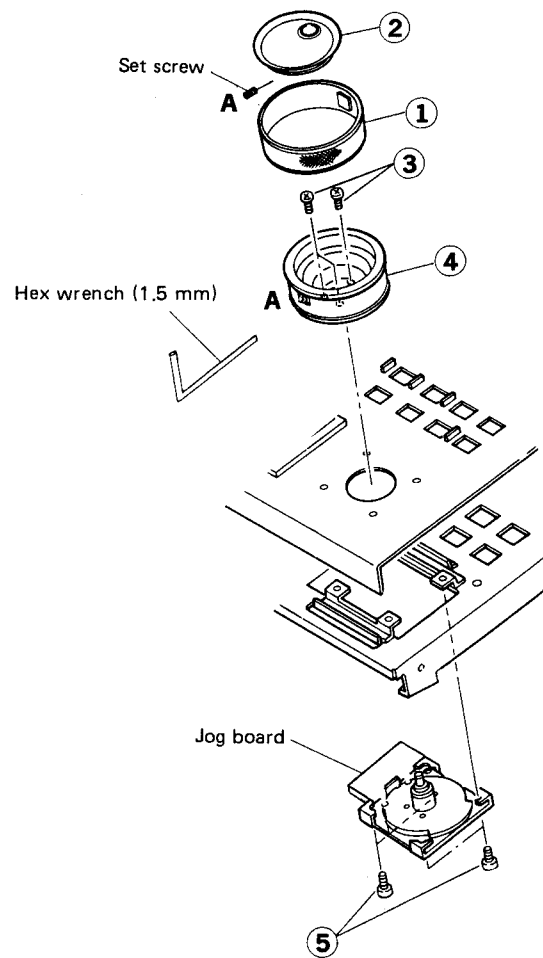


Fig. 2 Search/jog knobs and control assembly

1.3 SEARCH/JOG CONTROL ASSEMBLY INSTALLATION

1. When inserting the screws ⑤ of Fig. 2, tighten to the degree the structure does not distort (3 to 4 kg·cm torque). After tightening, apply screw sealant to screw hole.

Note 1: If the screws are too tight, the search plate and search knob will not turn smoothly. If this occurs, set the section horizontally and retighten the screws to 3 to 4 kg·cm torque (Fig. 3).

Note 2: Be sure to apply screw sealant to prevent loosening and loss.

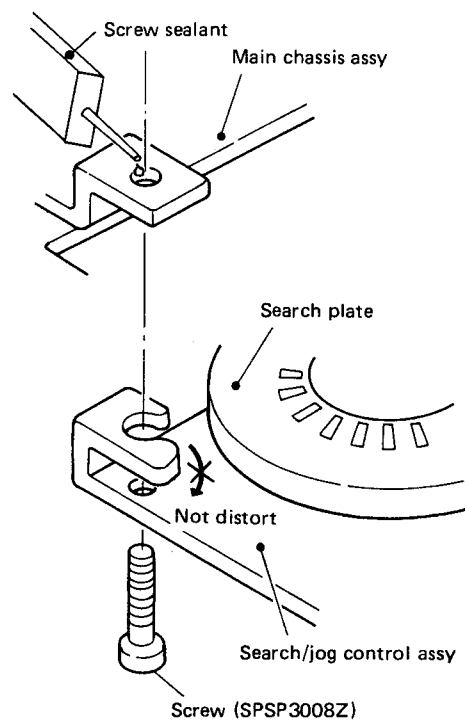
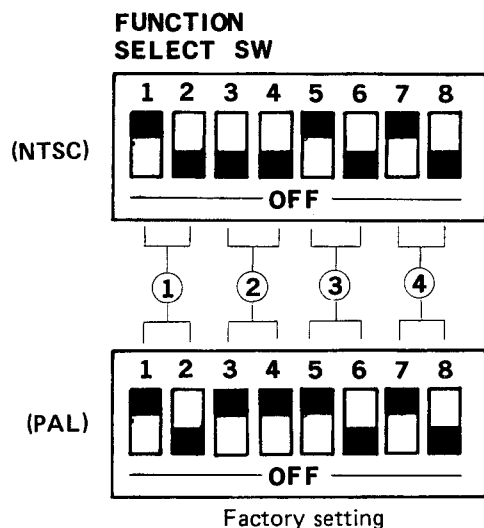


Fig. 3

1.4 DIP SWITCHES

1.4.1 Function select switches (rear panel)

These switches can be used for setting the following functions.



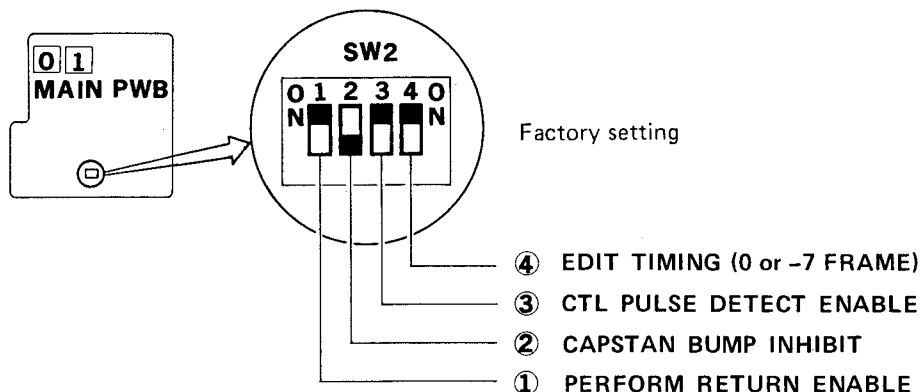
- ① EDIT IN TIMING ADJUSTMENT
- ② PREROLL TIMING ADJUSTMENT
- ③ RECORDER PB/REC REFERENCE SIGNAL SELECTION
- ④ PLAYER PB/REC REFERENCE SIGNAL SELECTION

No.	Item	Switch setting																									
1	Edit in timing	<p>The recorder edit in point can be set for -3/-2/-1/0 frames.</p> <table><tr><th>Frame setting SW No.</th><th>-3 frames</th><th>-2 frames</th><th>-1 frames</th><th>0 frame</th></tr><tr><td>1</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>2</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr></table> <p>Following positions are recommended for the indicated models.</p> <table><tr><th>Model</th><th>Frame setting</th></tr><tr><td>BR-S810U/BR-S810E</td><td>-2 frames</td></tr><tr><td>BR-8600U/BR-8600E</td><td>0 frame</td></tr><tr><td>KR-M800U/KR-M800E</td><td>-3 frames</td></tr><tr><td>CR-850U/PR-900E</td><td>-3 frames</td></tr></table>	Frame setting SW No.	-3 frames	-2 frames	-1 frames	0 frame	1	OFF	ON	OFF	ON	2	OFF	OFF	ON	ON	Model	Frame setting	BR-S810U/BR-S810E	-2 frames	BR-8600U/BR-8600E	0 frame	KR-M800U/KR-M800E	-3 frames	CR-850U/PR-900E	-3 frames
Frame setting SW No.	-3 frames	-2 frames	-1 frames	0 frame																							
1	OFF	ON	OFF	ON																							
2	OFF	OFF	ON	ON																							
Model	Frame setting																										
BR-S810U/BR-S810E	-2 frames																										
BR-8600U/BR-8600E	0 frame																										
KR-M800U/KR-M800E	-3 frames																										
CR-850U/PR-900E	-3 frames																										
2	Preroll timing	<p>The preroll time can be set for 3/5/7/10 seconds.</p> <p>Note: With MAIN board SW2-2 OFF, setting 7 or 10 seconds automatically produces the bump mode.</p> <table><tr><th>Preroll time SW No.</th><th>3 sec</th><th>5 sec</th><th>7 sec</th><th>10 sec</th></tr><tr><td>3</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td></tr><tr><td>4</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr></table>	Preroll time SW No.	3 sec	5 sec	7 sec	10 sec	3	ON	OFF	OFF	ON	4	OFF	OFF	ON	ON										
Preroll time SW No.	3 sec	5 sec	7 sec	10 sec																							
3	ON	OFF	OFF	ON																							
4	OFF	OFF	ON	ON																							

No.	Item	Switch setting																																																																											
3	PB, REC Reference signal	<div>Recorder and player readout counter detection can be set for control signal or capstan FG signal.</div> <table><tr><th></th><th>SW No.</th><th>Readout counter detection</th><th>CTL PULSE</th><th>CAP FG</th></tr><tr><td rowspan="2">Recorder</td><td>5</td><td></td><td>ON</td><td>OFF</td></tr><tr><td>6</td><td></td><td>OFF</td><td>ON</td></tr><tr><td rowspan="2">Player</td><td>7</td><td></td><td>ON</td><td>OFF</td></tr><tr><td>8</td><td></td><td>OFF</td><td>ON</td></tr></table> <div>The following table indicates Function switch settings according to connected model.</div> <table><tr><th colspan="4">Connected models</th><th colspan="2">RM-G810U</th></tr><tr><th rowspan="2">Models</th><th colspan="2">45 pin connector out</th><th rowspan="2">Counter indication</th><th colspan="2">Function select SW setting</th></tr><tr><th>32P (CTL)</th><th>35P (CAP FG)</th><th>SW5 SW7</th><th>SW6 SW8</th></tr><tr><td>BR-S810U/BR-S810E</td><td>CTL PULSE</td><td>** CTL/ *CAP FG</td><td>CTL PULSE</td><td>ON</td><td>OFF</td></tr><tr><td>BR-8600U/BR-8600E</td><td>* CTL PULSE</td><td>* CAP FG</td><td>REEL FG</td><td>OFF</td><td>ON</td></tr><tr><td>BR-7700U/BR-6600E</td><td>* CTL PULSE</td><td>* CAP FG</td><td>REEL FG</td><td>OFF</td><td>ON</td></tr><tr><td>KR-M800U/KR-M800E</td><td>CTL PULSE</td><td>CTL PULSE</td><td>CTL PULSE</td><td>ON</td><td>OFF</td></tr><tr><td>CR-850U/PR-900E</td><td>CTL PULSE</td><td>CAP FG</td><td>** CAP FG/CTL</td><td>ON</td><td>OFF</td></tr><tr><td>CR-600U/PR-600E</td><td>CTL PULSE</td><td>CAP FG</td><td>** CAP FG/CTL</td><td>ON</td><td>OFF</td></tr></table> <div><div>* No output during FF/REW.</div><div>** Selectable by internal switch.</div><div><div>Note:</div><div>Use the following VCR switch settings when connecting the BR-S810U/E and KR-M800U/E.</div><div><div><div>● BR-S810U/E</div><div>Syscon board DIP SW1-1: OFF.</div><div>45-pin connector board SW1: CAP FG</div></div><div><div>● KR-M800U/E</div><div>Syscon board DIP SW1-7: ON.</div></div></div></div></div>		SW No.	Readout counter detection	CTL PULSE	CAP FG	Recorder	5		ON	OFF	6		OFF	ON	Player	7		ON	OFF	8		OFF	ON	Connected models				RM-G810U		Models	45 pin connector out		Counter indication	Function select SW setting		32P (CTL)	35P (CAP FG)	SW5 SW7	SW6 SW8	BR-S810U/BR-S810E	CTL PULSE	** CTL/ *CAP FG	CTL PULSE	ON	OFF	BR-8600U/BR-8600E	* CTL PULSE	* CAP FG	REEL FG	OFF	ON	BR-7700U/BR-6600E	* CTL PULSE	* CAP FG	REEL FG	OFF	ON	KR-M800U/KR-M800E	CTL PULSE	CTL PULSE	CTL PULSE	ON	OFF	CR-850U/PR-900E	CTL PULSE	CAP FG	** CAP FG/CTL	ON	OFF	CR-600U/PR-600E	CTL PULSE	CAP FG	** CAP FG/CTL	ON	OFF
	SW No.	Readout counter detection	CTL PULSE	CAP FG																																																																									
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BR-S810U/BR-S810E	CTL PULSE	** CTL/ *CAP FG	CTL PULSE	ON	OFF																																																																								
BR-8600U/BR-8600E	* CTL PULSE	* CAP FG	REEL FG	OFF	ON																																																																								
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KR-M800U/KR-M800E	CTL PULSE	CTL PULSE	CTL PULSE	ON	OFF																																																																								
CR-850U/PR-900E	CTL PULSE	CAP FG	** CAP FG/CTL	ON	OFF																																																																								
CR-600U/PR-600E	CTL PULSE	CAP FG	** CAP FG/CTL	ON	OFF																																																																								

1.4.2 MAIN board DIP switches

These can be used for the following settings.



No.	Item	Switch setting						
1	Perform return	<p>Selects return function at completion of Perform.</p> <table><tr><th>Switch ①</th><th>Setting effect</th></tr><tr><td>ON</td><td>Operation at Perform end Still, then Search mode to OUT point.</td></tr><tr><td>OFF</td><td>Still, no return function.</td></tr></table>	Switch ①	Setting effect	ON	Operation at Perform end Still, then Search mode to OUT point.	OFF	Still, no return function.
Switch ①	Setting effect							
ON	Operation at Perform end Still, then Search mode to OUT point.							
OFF	Still, no return function.							
2	Capstan Bump	<p>Selects external capstan search CMD output. Selects capstan bump mode ON/OFF. For capstan bump mode, preroll time is set for 7 or 10 seconds.</p> <table><tr><th>Switch ②</th><th>Setting effect</th></tr><tr><td>ON</td><td>No capstan bump ; external capstan search CMD (pin 42 of 45-pin connector) output not produced.</td></tr><tr><td>OFF</td><td>Capstan bump ; external capstan search CMD output (recorder mainframe V Speed CTL voltage changed from 2.9 V to 5 to 6 V).</td></tr></table>	Switch ②	Setting effect	ON	No capstan bump ; external capstan search CMD (pin 42 of 45-pin connector) output not produced.	OFF	Capstan bump ; external capstan search CMD output (recorder mainframe V Speed CTL voltage changed from 2.9 V to 5 to 6 V).
Switch ②	Setting effect							
ON	No capstan bump ; external capstan search CMD (pin 42 of 45-pin connector) output not produced.							
OFF	Capstan bump ; external capstan search CMD output (recorder mainframe V Speed CTL voltage changed from 2.9 V to 5 to 6 V).							
3	CTL pulse detect	<p>Selects control pulse for editing.</p> <table><tr><th>Switch ③</th><th>Setting effect</th></tr><tr><td>ON</td><td>Edit inhibited in absence of CTL signal; buzzer sounds (see Note).</td></tr><tr><td>OFF</td><td>Edit enabled without CTL signal (set Function Select switch for CAP FG).</td></tr></table> <p>Note: With KR-M800U/E or BR-S810U/E (SW1 of 45-pin connector board set to CTL), since CTL pulse output appears at both pins 32 and 33, NO CTL cannot be detected. Therefore, even with switch ON, edit is not inhibited and buzzer does not sound.</p>	Switch ③	Setting effect	ON	Edit inhibited in absence of CTL signal; buzzer sounds (see Note).	OFF	Edit enabled without CTL signal (set Function Select switch for CAP FG).
Switch ③	Setting effect							
ON	Edit inhibited in absence of CTL signal; buzzer sounds (see Note).							
OFF	Edit enabled without CTL signal (set Function Select switch for CAP FG).							

No.	Item	Switch setting	
4	Edit Timing (0 or -7 Frame)		
		Switch ④	Setting effect
		ON	Enables Edit in/out point setting with preset edit timing sw.
		OFF	Enables Edit in/out point setting to -7 frames.

SECTION 2

ELECTRICAL ADJUSTMENTS

2.1 BEFORE ADJUSTING

2.1.1 Power supply

Power is supplied and the unit is operable when connected to VTRs. However, although 12 V is obtained via pin 34 of the 45-pin connector, since the recorder and player side circuits are independent, power is obtained from both machines.

2.1.2 Main circuit 5 V

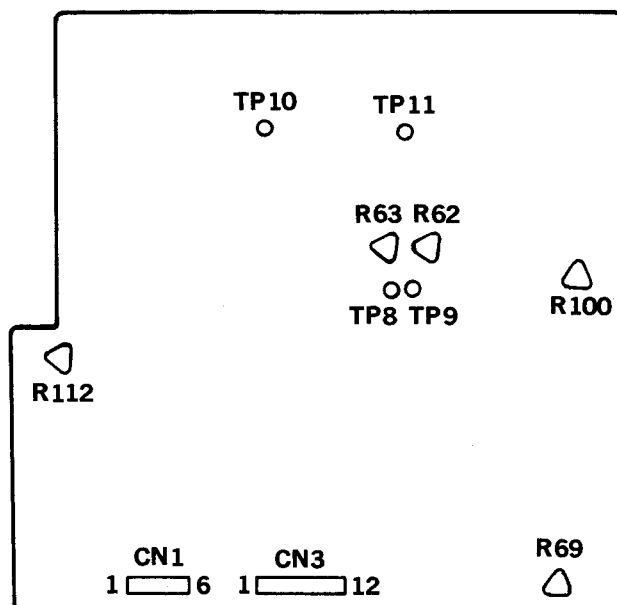
Before proceeding to other checks and adjustments, with both recorder and player connected, check according to the table.

Check point Measure side	CN1 [1 pin]	CN3 [9 pin]	CN3 [10 pin]
Recorder	$4.9 \pm 0.2 \text{ V}$		$5.2 \pm 0.2 \text{ V}$
Player	$4.9 \pm 0.2 \text{ V}$	$5.2 \pm 0.2 \text{ V}$	

- Notes:**
- Supply power only to the side being measured. Disconnect the cable of the other side.
 - Also, for subsequent adjustments and checks, supply power only to the side being adjusted.
 - Use the accessory cable (5 m).

2.2 MAIN CIRCUIT

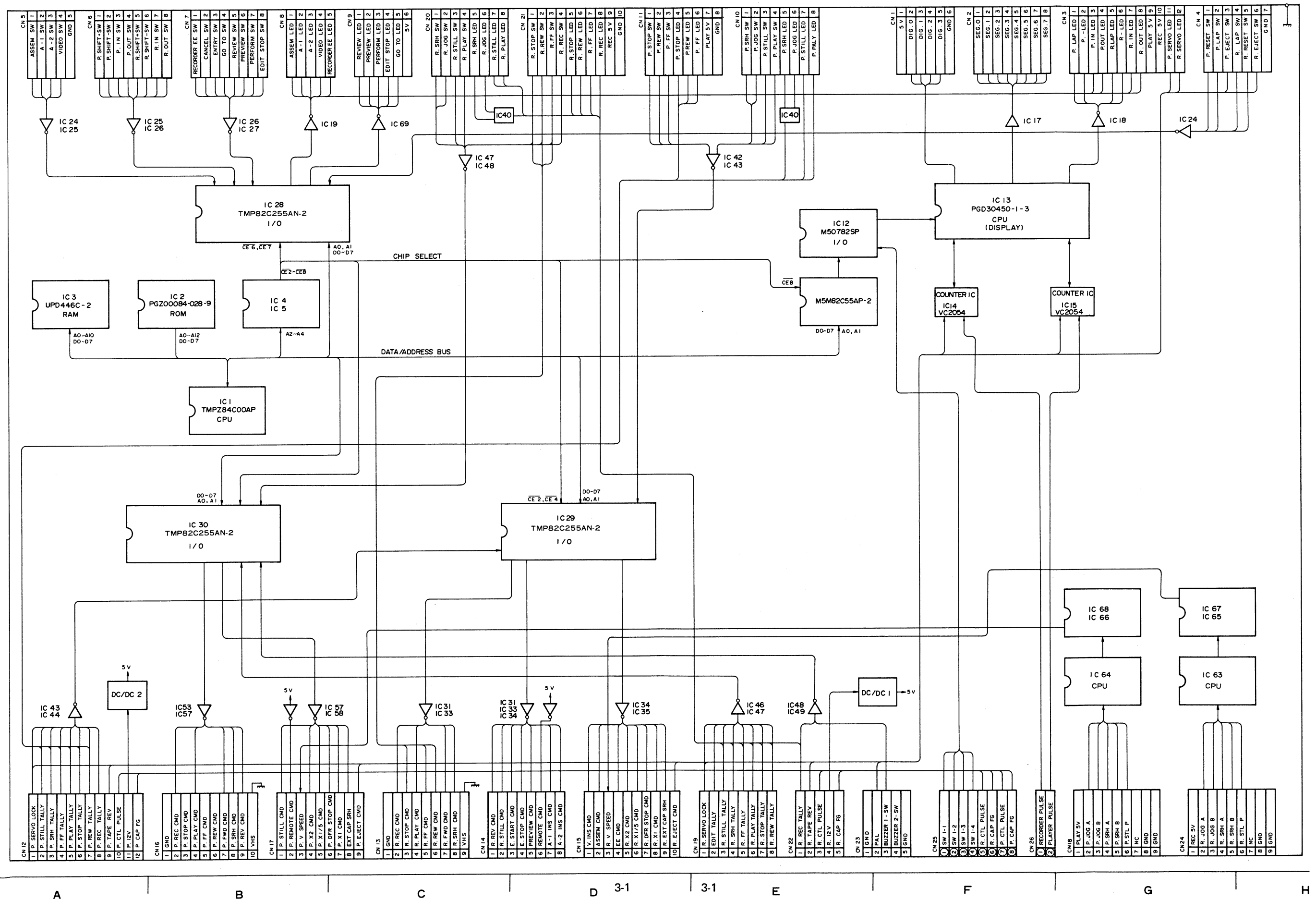
Check points and adjustments (parts side)



No.	Item	Check point	Adjustment parts	Mode	Description																																
1	Search voltage	TP10 [Player] TP11 [Recorder]	R112 [Player] R69 [Recorder]	STILL	<ol style="list-style-type: none"> Set Search dials to the STILL position. Use a digital voltmeter to measure the testpoints. Adjust R112 for TP10 and R69 for TP11 to obtain 2.7 ± 0.05 V. 																																
				SEARCH	<ol style="list-style-type: none"> In the Search mode, operate the Search dial and confirm the following voltages. <table border="1"> <thead> <tr> <th>No.</th><th>Search dial position</th><th>Voltage (V)</th><th>No.</th><th>Search dial position</th><th>Voltage (V)</th></tr> </thead> <tbody> <tr> <td>1</td><td>STILL</td><td>2.70</td><td>6</td><td></td><td>5.00</td></tr> <tr> <td>2</td><td></td><td>3.05</td><td>7</td><td>x 1 (1st click)</td><td>5.90</td></tr> <tr> <td>3</td><td></td><td>3.45</td><td>8</td><td></td><td>7.50</td></tr> <tr> <td>4</td><td></td><td>3.85</td><td>9</td><td>(2nd click)</td><td>9.40</td></tr> <tr> <td>5</td><td></td><td>4.35</td><td>10</td><td>Maximum</td><td>11.50</td></tr> </tbody> </table>	No.	Search dial position	Voltage (V)	No.	Search dial position	Voltage (V)	1	STILL	2.70	6		5.00	2		3.05	7	x 1 (1st click)	5.90	3		3.45	8		7.50	4		3.85	9	(2nd click)	9.40	5	
No.	Search dial position	Voltage (V)	No.	Search dial position	Voltage (V)																																
1	STILL	2.70	6		5.00																																
2		3.05	7	x 1 (1st click)	5.90																																
3		3.45	8		7.50																																
4		3.85	9	(2nd click)	9.40																																
5		4.35	10	Maximum	11.50																																
2	CAP BUMP 1	TP9	R63	STOP	<ol style="list-style-type: none"> Connect a digital voltmeter to TP9. Adjust R63 for 5.10 ± 0.05 V. 																																
3	CAP BUMP 2	TP8	R62	STOP	<ol style="list-style-type: none"> Connect a digital voltmeter to TP8. Adjust R62 for 5.9 ± 0.05 V. 																																
4	Buzzer volume	—	R100	STOP	<ol style="list-style-type: none"> Set rear panel BUZZER switch to BUZZER 1. Turn R100 counter-clockwise and confirm that buzzer volume decreases. Turn R100 fully clockwise and confirm maximum volume. Set R100 to about center position. 																																

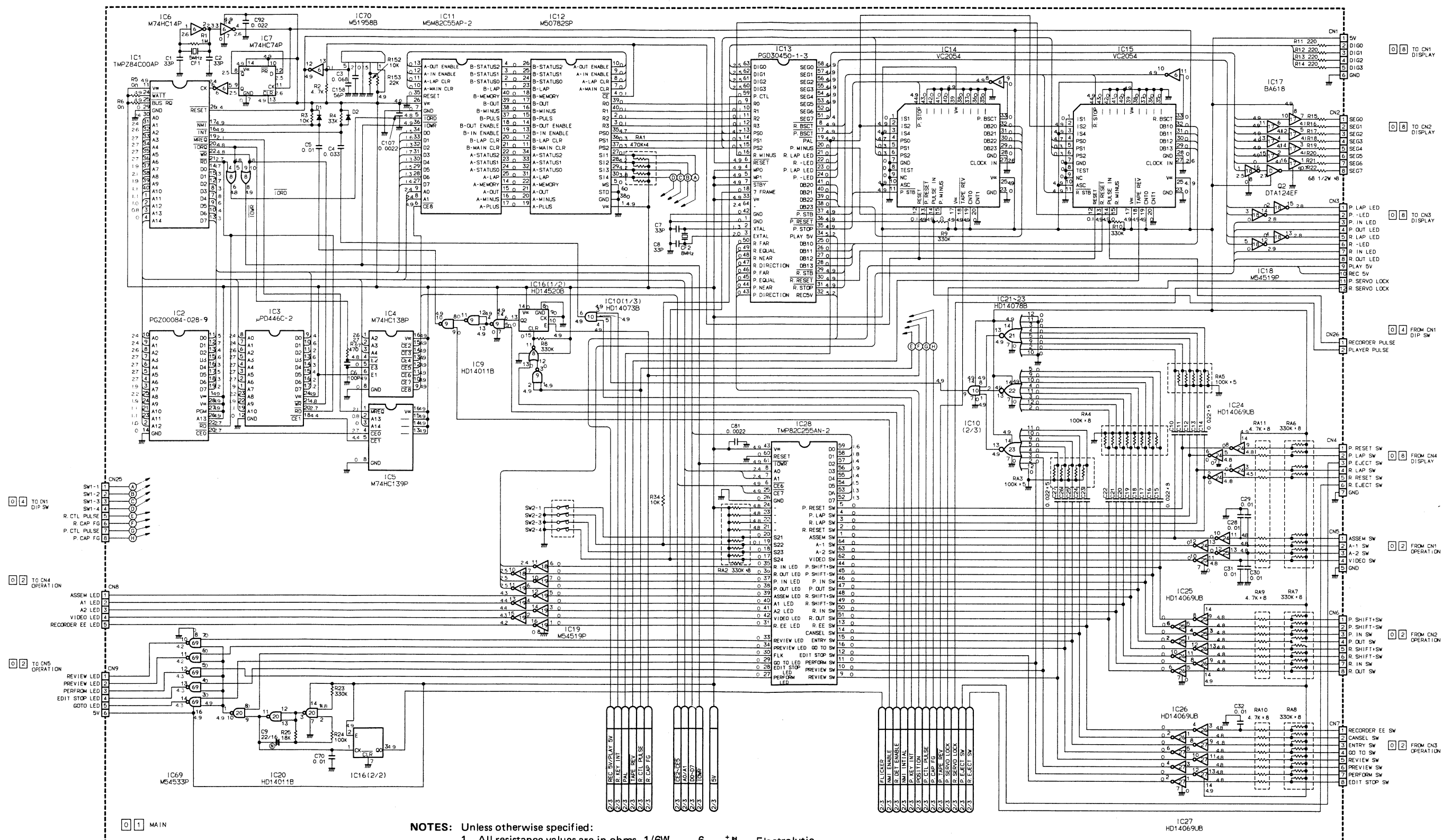
SECTION 3
CHARTS AND DIAGRAMS

3.1 BLOCK DIAGRAM

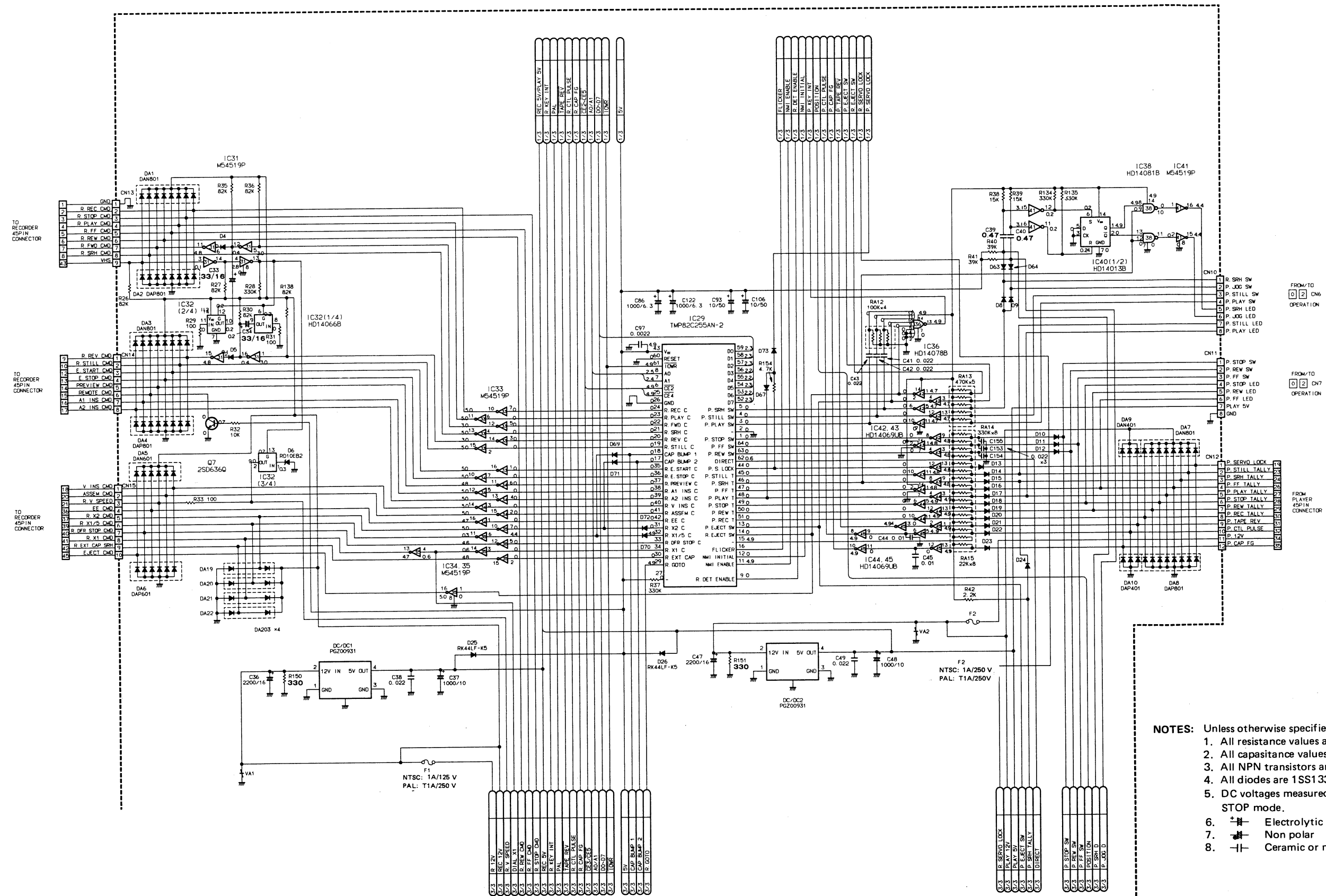


3.2 MAIN SCHEMATIC DIAGRAM

- DIAGRAM 1/3 -



— DIAGRAM 2/3 —



- NOTES: Unless otherwise specified:
1. All resistance values are in ohms. 1/6W
 2. All capacitance values are in μ F.
 3. All NPN transistors are 2SD636Q.
 4. All diodes are 1SS133.
 5. DC voltages measured with DVM in STOP mode.
 6. $\text{---}\text{---}$ Electrolytic
 7. $\text{---}\text{---}$ Non polar
 8. $\text{---}\text{---}$ Ceramic or mylar

5

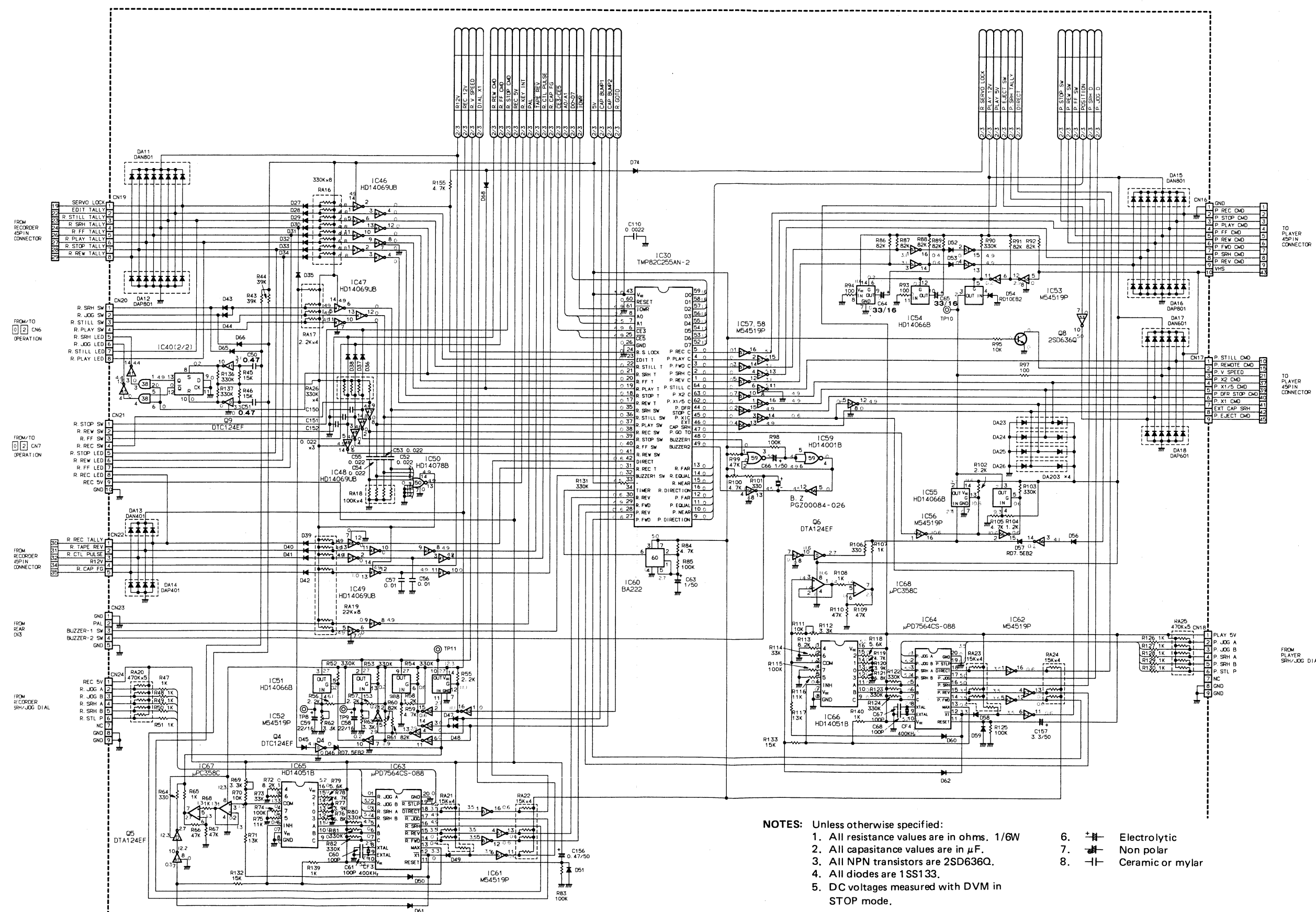
4

3




2

1

– DIAGRAM 3/3 –



NOTES: Unless otherwise specified:

1. All resistance values are in ohms. 1/6W
2. All capacitance values are in μF .
3. All NPN transistors are 2SD636Q.
4. All diodes are 1SS133.
5. DC voltages measured with DVM in STOP mode.
6.  Electrolytic
7.  Non polar
8.  Ceramic or mylar

6

3.3 MAIN CIRCUIT BOARD

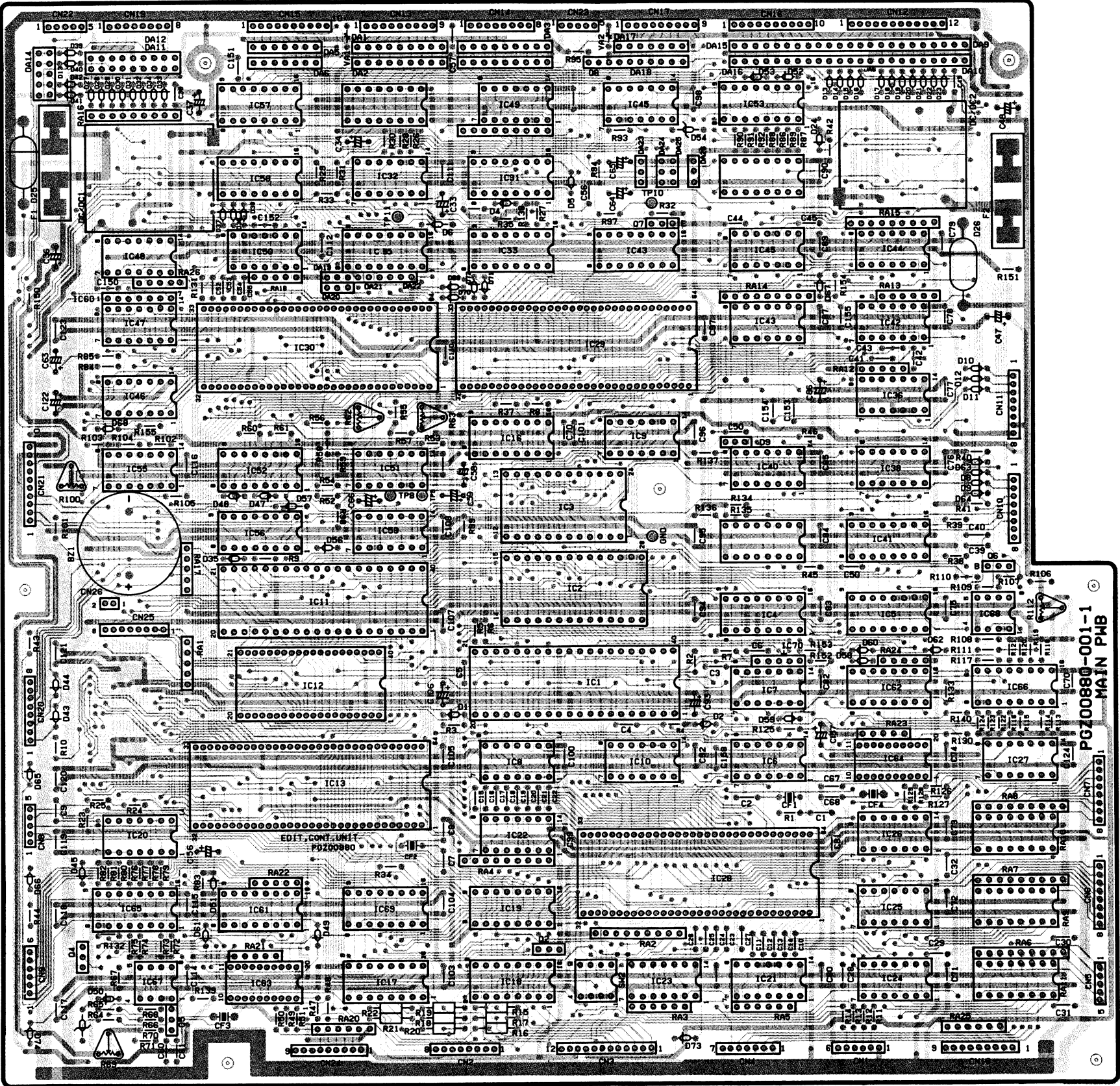
5

4

3

2

1



A

B

C

D 3-5

3-5

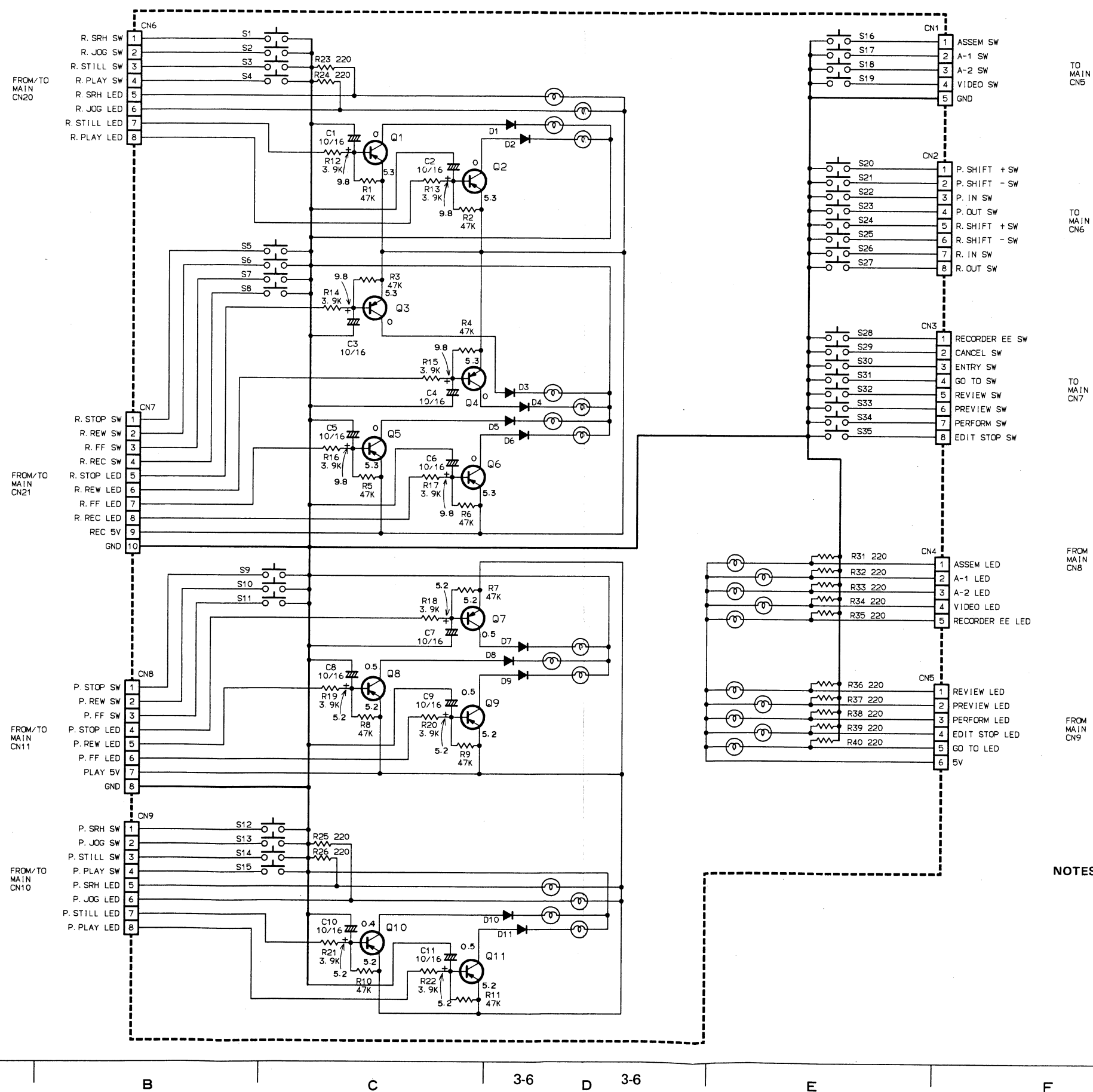
E

F

G

H

3.4 OPERATION SCHEMATIC DIAGRAM



- NOTES:** Unless otherwise specified:
1. All resistance values are in ohms. 1/6W
 2. All capacitance values are in μ F.
 3. All PNP transistors are 2SB644.
 4. All diodes are 1SS133.
 5. DC voltages measured with DVM in STOP mode.
 6. $\text{---} \text{---} \text{---}$ Electrolytic

6



4

3

2

1

A

B

C

D 3-7

3-7

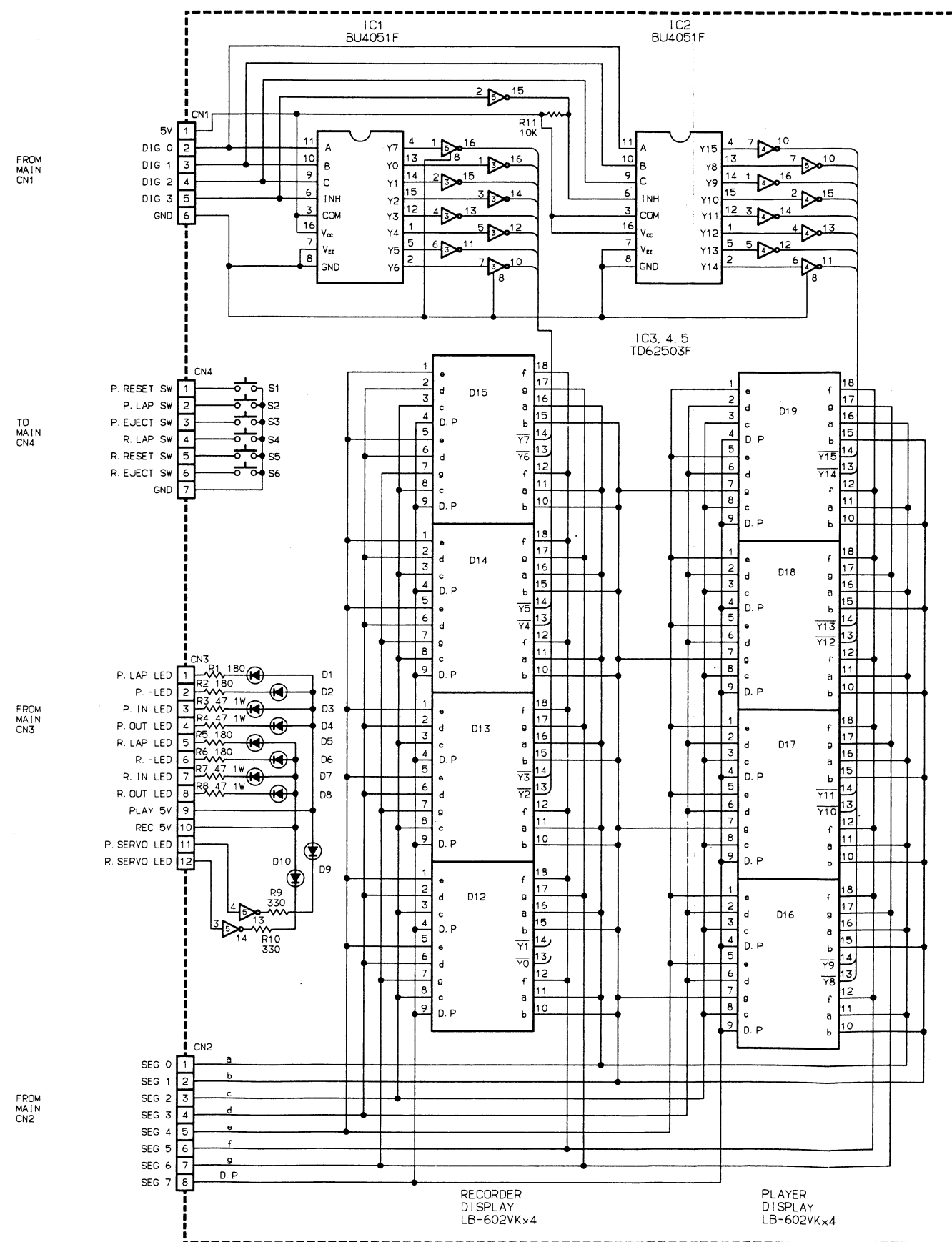
E

F

G

H

3.6 DISPLAY SCHEMATIC DIAGRAM

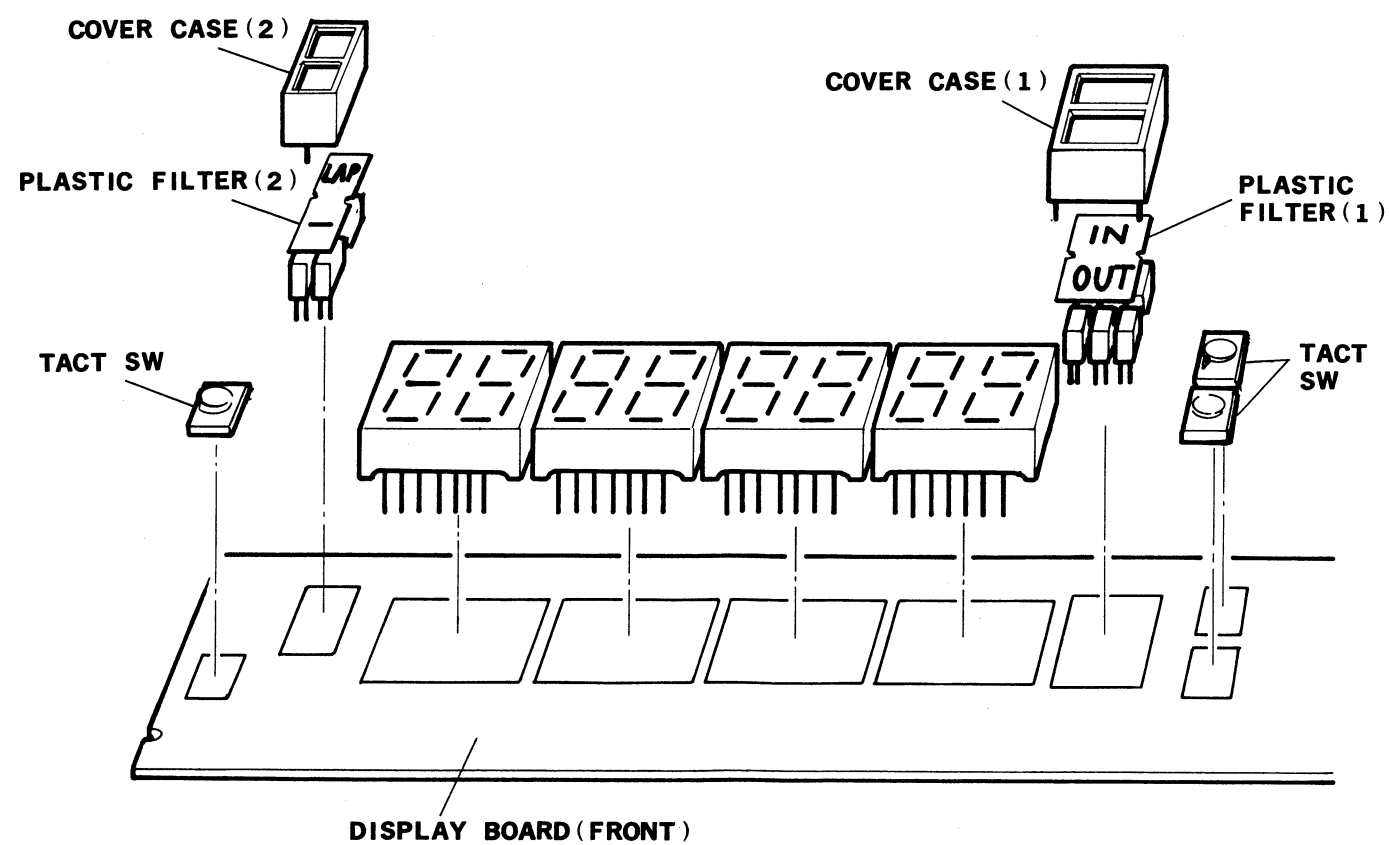
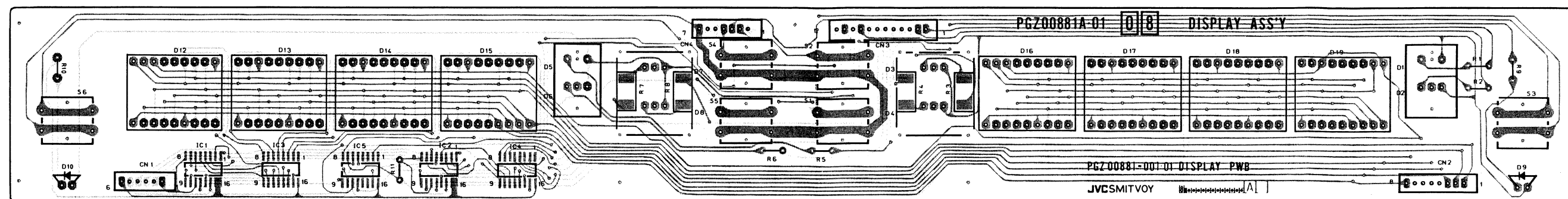


- NOTES: Unless otherwise specified:
1. All resistance values are in ohms. 1/6W
 2. Electrolytic
 3. D1, D2, D5, D6 LD-001VR

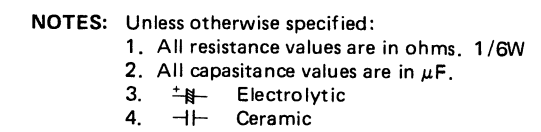
4. D3, D4, D7, D8 LD-603MG

5. D9, D10 SLB-25MG

3.7 DISPLAY CIRCUIT BOARD

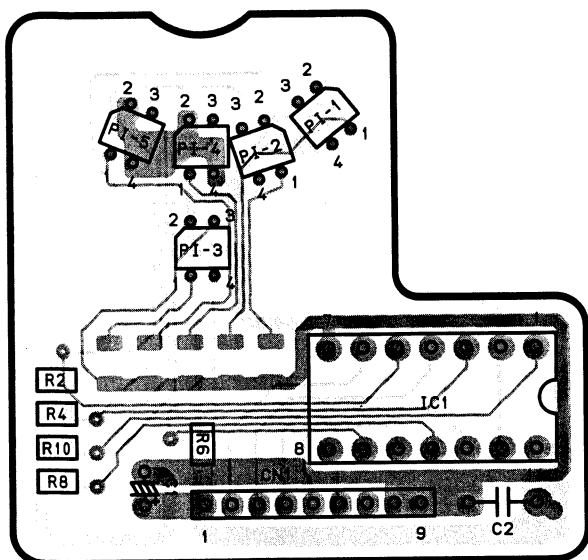


1

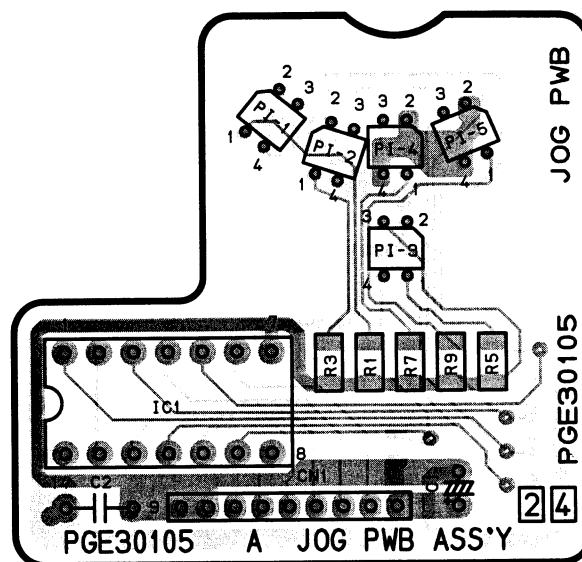


3.9 JOG CIRCUIT BOARD

PARTS SIDE

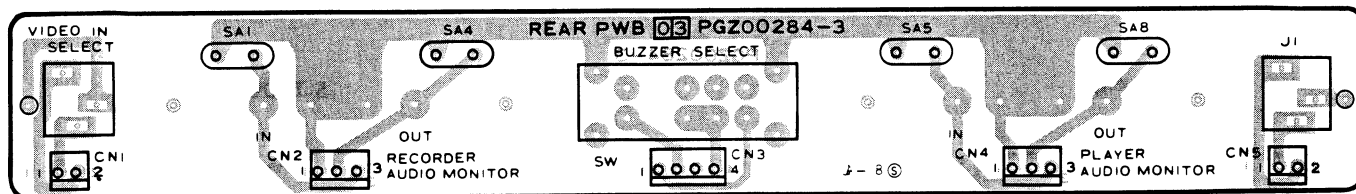


SOLDER SIDE

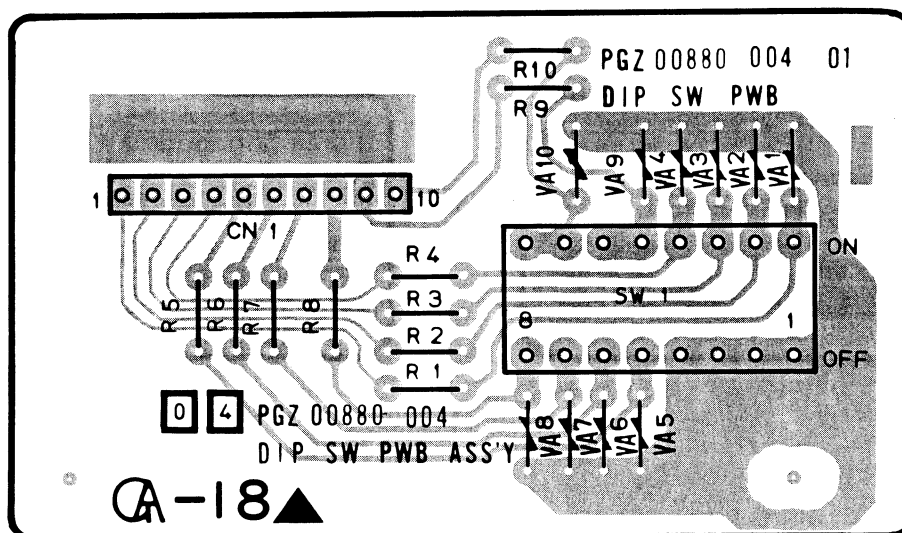


3.10 REAR, DIP SW, FRAME SELECT AND SLIDE VR CIRCUIT BOARDS

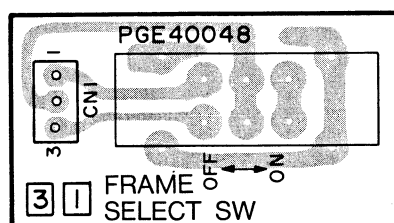
— REAR —



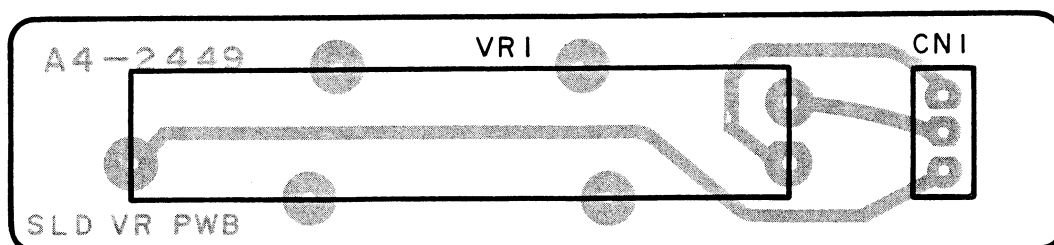
— DIP SWITCH —



— FRAME SELECT SW —

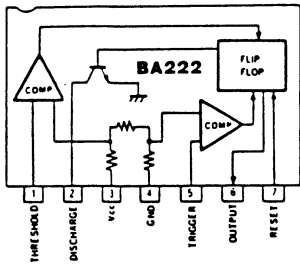


— SLIDE VOLUME —

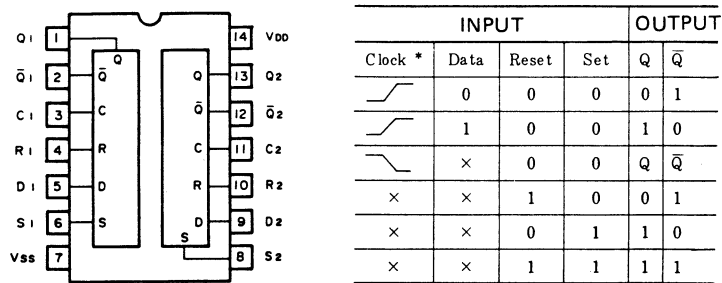


3.12 IC BLOCK DIAGRAMS

— BA222 —
Monolithic Timer

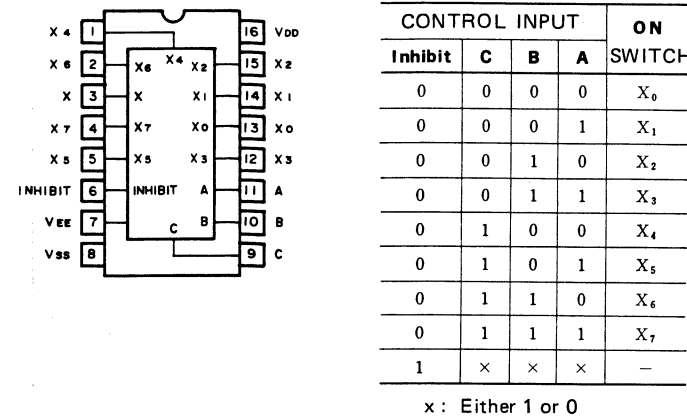


— HD14013B —
Dual D-type Flip-Flop

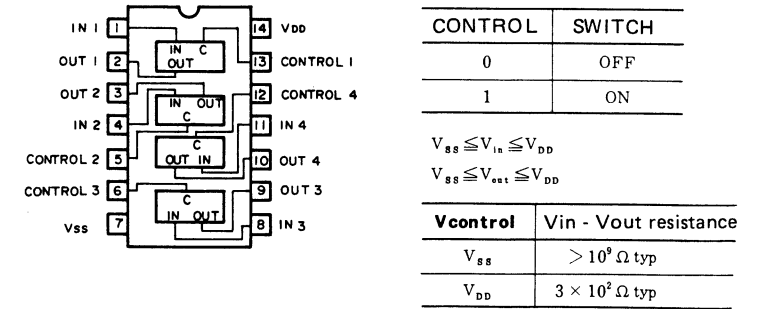


* : Level change
x : Either 1 or 0

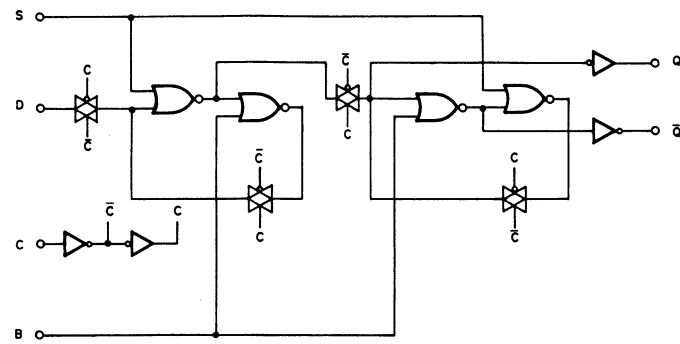
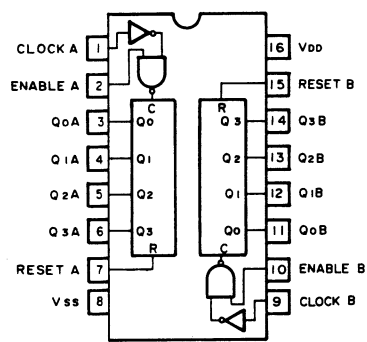
— HD14051B —
8-channel Analog Multiplexer/Demultiplexer



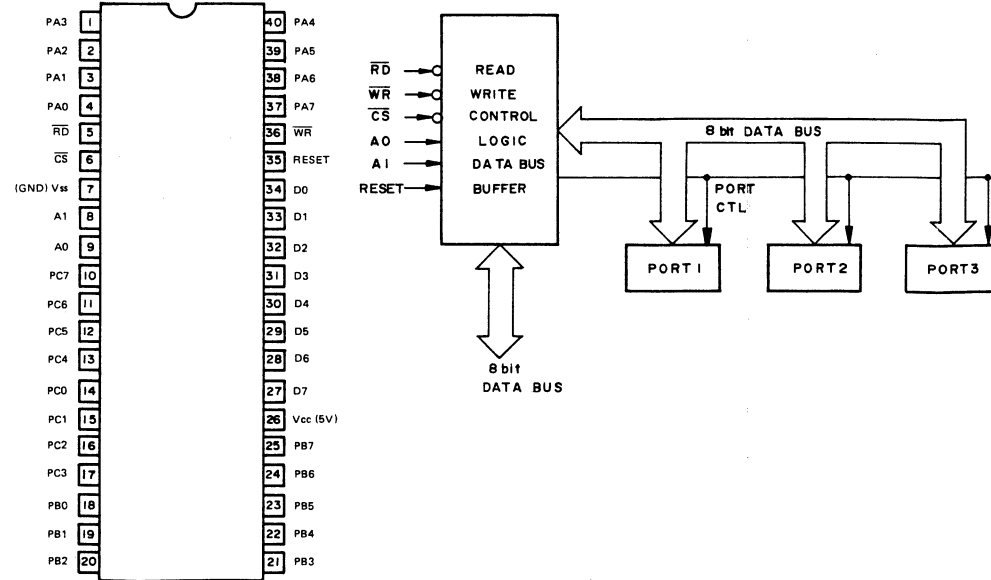
— HD14066B —
Quadruple Analog Switch/Quadruple Multiplexer



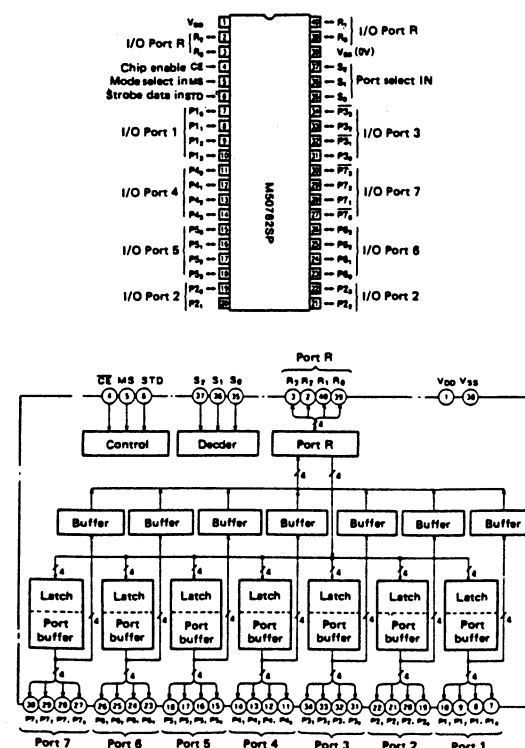
— HD14520B —
Dual Binary Up Counter



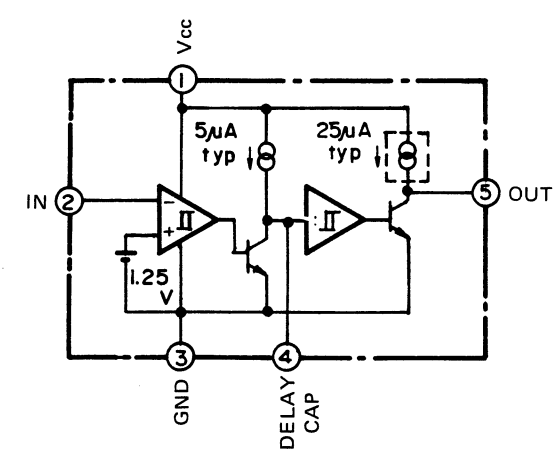
— M5M82C55AP-2 —



— M50782SP —
Input/Output Expander



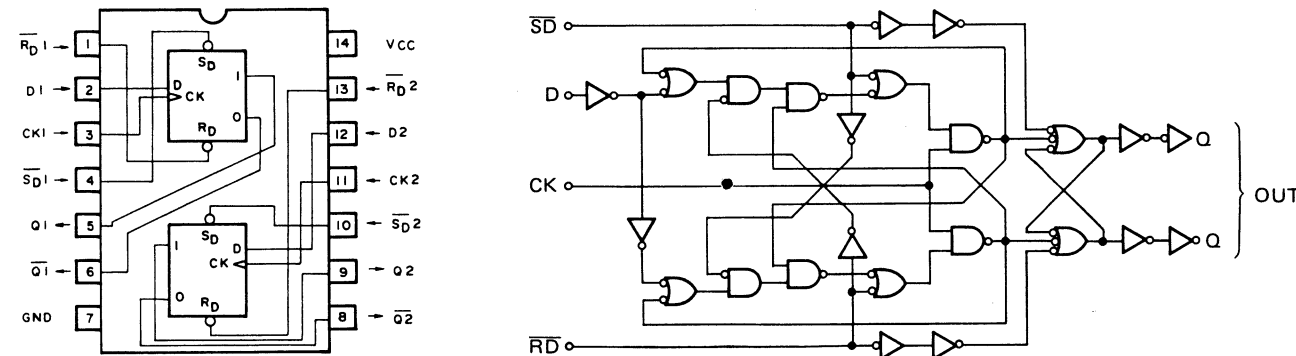
— M51958BL —



Clock	Enable	Reset	Operating
0	1	0	Count
0	0	0	Count
0	x	0	No change
0	0	0	No change
1	0	0	No change
x	x	1	Q ₀ ~ Q ₃ = 0

x : Either 1 or 0

— M74HC74P —
Dual D-type Flip-Flop with Set and Reset

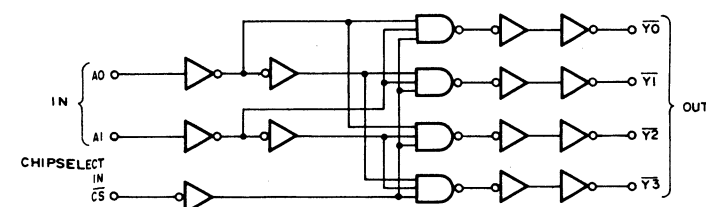
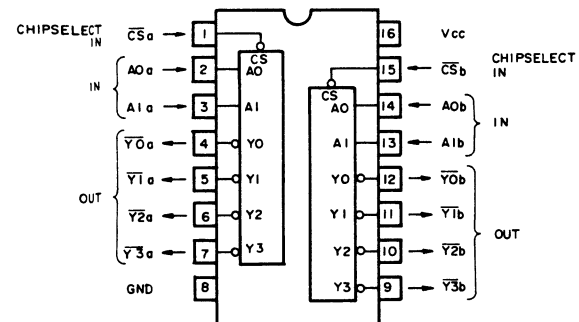


TRUTH TABLE NOTE 1

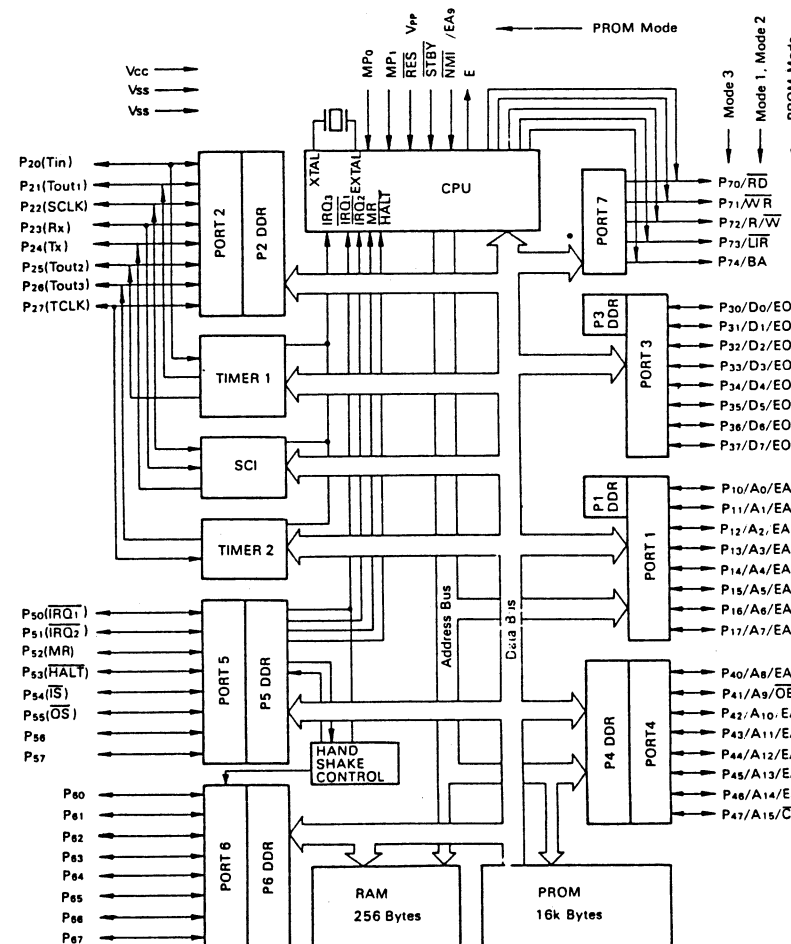
入	力	出	力
$\overline{S_D}$	$\overline{R_D}$	CK	D
L	H	x	x
H	L	x	x
L	L	x	x
H	H	L	x
H	H	↑	H
H	H	↑	L
H	H	H	x
H	H	↓	x

NOTE 1 x : Either "L" or "H"
↑ : Rise from "L" to "H"
↓ : Fall from "H" to "L"
Q° : Q output state before clock input change
Q° : Q output state before clock input change
* : Q = Q° = "H" when SD = RD = "L".
But when SD and RD are simultaneously "H", Q and Q states are unpredictable.

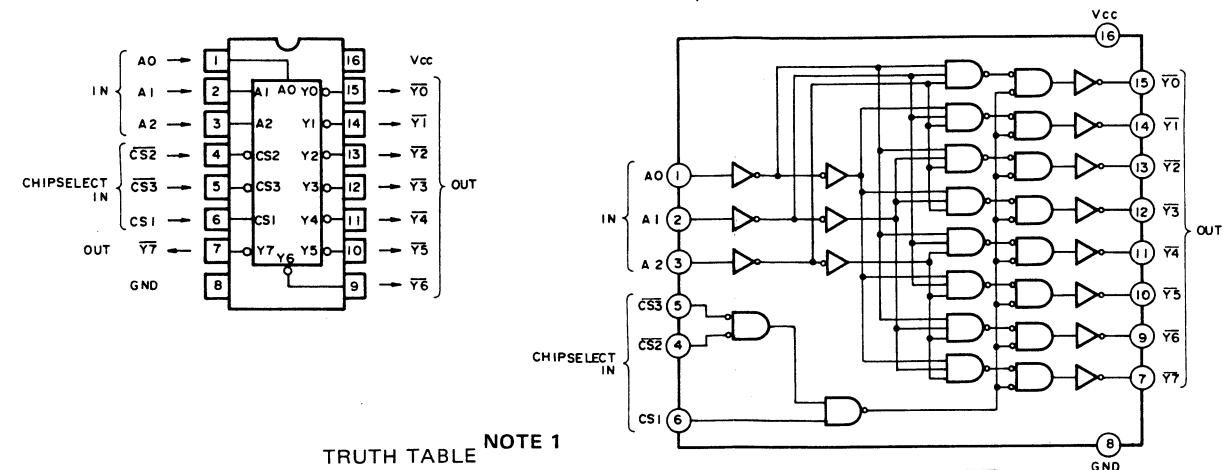
— M74HC139P —
Dual 1-of-4 Decoder/Demultiplexer



— PGD30450-1-3 —
C MOS MCU (Micro Computer Unit)



— M74HC138P —
1-of-8 Decoder/Demultiplexer



TRUTH TABLE NOTE 1

IN					OUT								
CS1	CSX	A2	A1	A0	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	
X	H	X	X	X	H	H	H	H	H	H	H	H	
L	X	X	X	X	H	H	H	H	H	H	H	H	
H	L	L	L	L	L	H	H	H	H	H	H	H	
H	L	L	L	H	H	L	H	H	H	H	H	H	
H	L	L	H	L	H	H	L	H	H	H	H	H	
H	L	L	H	H	H	H	H	L	H	H	H	H	
H	L	H	L	L	H	H	H	H	L	H	H	H	
H	L	H	L	H	H	H	H	H	L	H	H	H	
H	L	H	H	L	H	H	H	H	H	L	H	H	
H	L	H	H	H	H	H	H	H	H	H	H	L	

NOTE 1 CSX = CS2 + CS3
x : Either "H" or "L"

Pin No.	Description	Pin No.	Description	Pin No.	Description	Pin No.	Description
1	GND	17	P.BSCT	33	VCC	49	R.EQUAL
2	XTAL	18	0/6 FRAME	34	PLAY 5V	50	R.FAR
3	EXTAL	19	PAL	35	P.STOP	51	SEG7
4	MP0	20	P.MINUS	36	P.RESET	52	SEG6
5	MP1	21	R.LAP LED	37	P.STB	53	SEG5
6	RESET	22	R.-LED	38	DB23	54	SEG4
7	STBY	23	P.LAP LED	39	DB22	55	SEG3
8	R.BSCT	24	P.-LED	40	DB21	56	SEG2
9	R0	25	DB10	41	DB20	57	SEG1
10	R1	26	DB11	42	GND	58	SEG0
11	R2	27	DB12	43	P.DIRECTION	59	CAPSTAN BUMP
12	R3	28	DB13	44	P.NEAR	60	DIG3
13	PS0	29	R.STB	45	P.EQUAL	61	DIG2
14	PS1	30	R.RESET	46	P.FAR	62	DIG1
15	PS2	31	R.STOP	47	R.DIRECTION	63	DIG0
16	R.MINUS	32	REC 5V	48	R.NEAR	64	E

— TC74HC238F —
3-to-8 Line Decoder

TRUTH TABLE

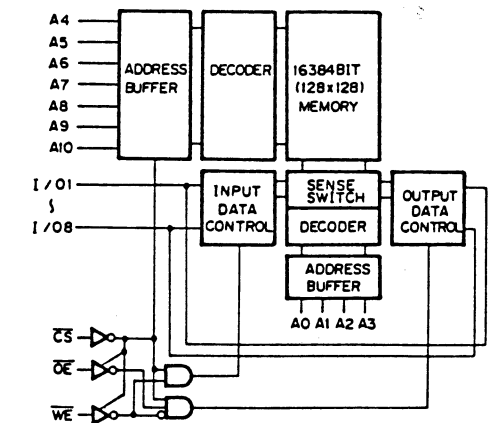
INPUTS						OUTPUTS								SELECTED OUTPUT
ENABLE			SELECT			Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	
G2B	G2A	G1	C	B	A									
X	X	L	X	X	X	L	L	L	L	L	L	L	L	NONE
X	H	X	X	X	X	L	L	L	L	L	L	L	L	NONE
H	X	X	X	X	X	L	L	L	L	L	L	L	L	NONE
L	L	H	L	L	L	H	L	L	L	L	L	L	L	Y0
L	L	H	L	L	H	L	L	L	L	L	L	L	L	Y1
L	L	H	L	L	H	L	L	L	L	L	L	L	L	Y2
L	L	H	L	H	L	L	L	L	L	L	L	L	L	Y3
L	L	H	H	L	L	L	L	L	L	H	L	L	L	Y4
L	L	H	H	L	H	L	L	L	L	L	H	L	L	Y5
L	L	H	H	L	H	L	L	L	L	L	L	H	L	Y6
L	L	H	H	H	L	L	L	L	L	L	L	L	H	Y7

X : DON'T CARE

A 11	1	40	A10
A 12	2	39	A 9
A 13	3	38	A 8
A 14	4	37	A 7
A 15	5	36	A 6
CLK	6	35	A 5
D 4	7	34	A 4
D 3	8	33	A 3
D 5	9	32	A 2
D 6	10	31	A 1
Vcc	11	30	A 0
D 2	12	29	Vss
D 7	13	28	RFSH
D 0	14	27	M I
D 1	15	26	RESET
INT	16	25	BUSREQ
NMI	17	24	WAIT
HALT	18	23	BUSACK
MREQ	19	22	WR
IORQ	20	21	RD

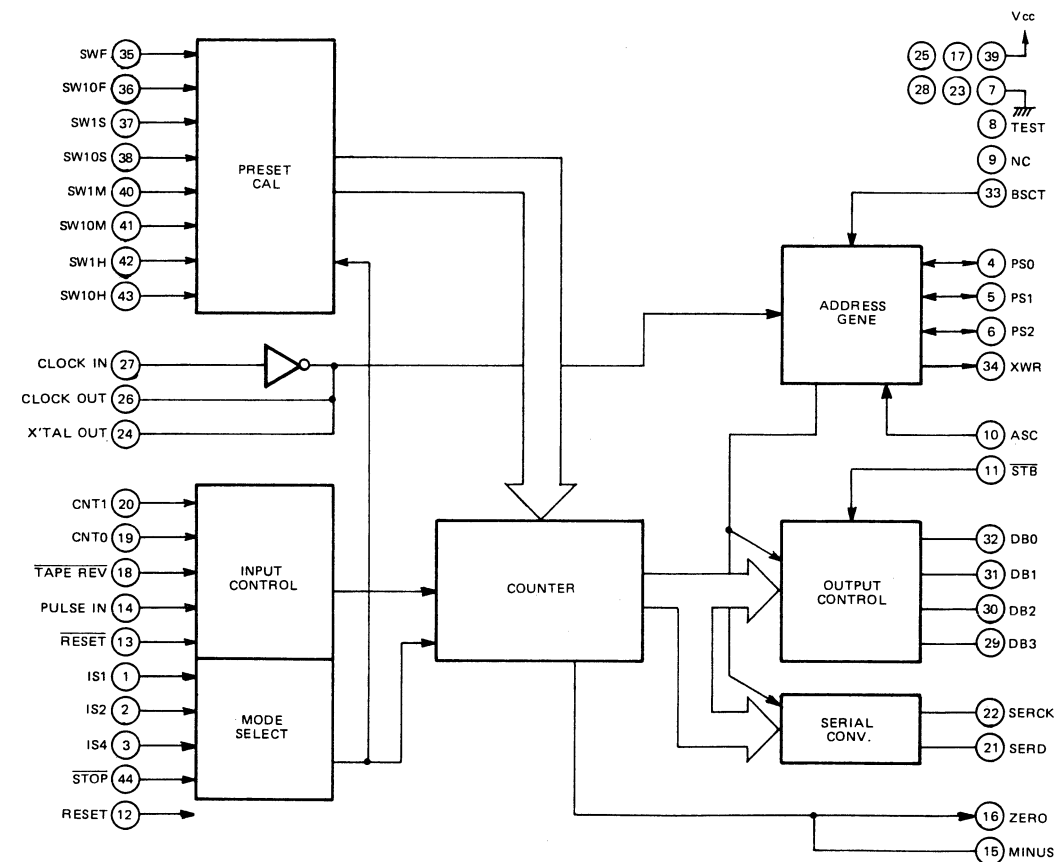
TOP VIEW

PA04	1	64	PA05
PA03	2	63	PA06
PA02	3	62	PA07
PA01	4	61	R/W
PA00	5	60	RESET
CS0	6	59	D0
A1	7	58	D1
A0	8	57	D2
PC07	9	56	D3
PC06	10	55	D4
PC05	11	54	D5
PC04	12	53	D6
PC00	13	52	D7
PC01	14	51	PB07
PC02	15	50	PB06
PC03	16	49	PB05
PA17	17	48	PB04
PA16	18	47	PB03
PA15	19	46	PB02
PA14	20	45	PB01
PA13	21	44	PB00
PA12	22	43	VCC
PA11	23	42	PB17
PA10	24	41	PB16
CS1	25	40	PB15
GND	26	39	PB14
PC17	27	38	PB13
PC16	28	37	PB12
PC15	29	36	PB11
PC14	30	35	PB10
PC10	31	34	PC13
PC11	32	33	PC12



Pin diagram of the 80C86 microprocessor:

- Pin 1: P 00/INT0
- Pin 2: P 01/SCK
- Pin 3: P 02/S0
- Pin 4: P 03/S1
- Pin 5: P 80
- Pin 6: P B1
- Pin 7: P B2
- Pin 8: CL2/P B3
- Pin 9: CL I
- Pin 10: V dd
- Pin 11: RESET
- Pin 12: P 100
- Pin 13: P 101
- Pin 14: P 102
- Pin 15: P 103
- Pin 16: P 110
- Pin 17: P 111
- Pin 18: P 112
- Pin 19: P 113
- Pin 20: V ss



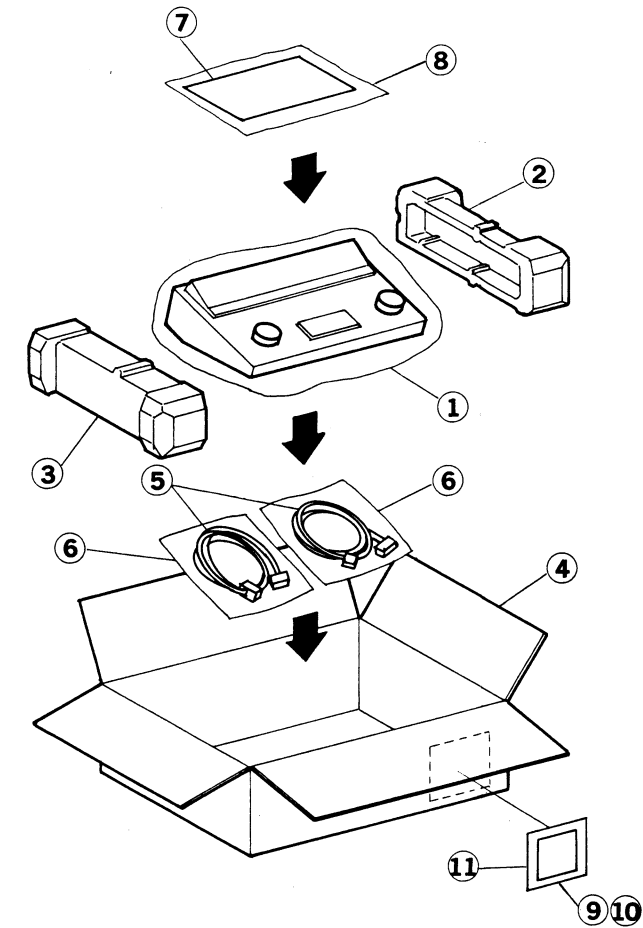
SECTION 4
EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety.
Replace only with specified part numbers.

NOTE:
● "X" indicates quantity per set.

4.1 PACKING ASSEMBLY

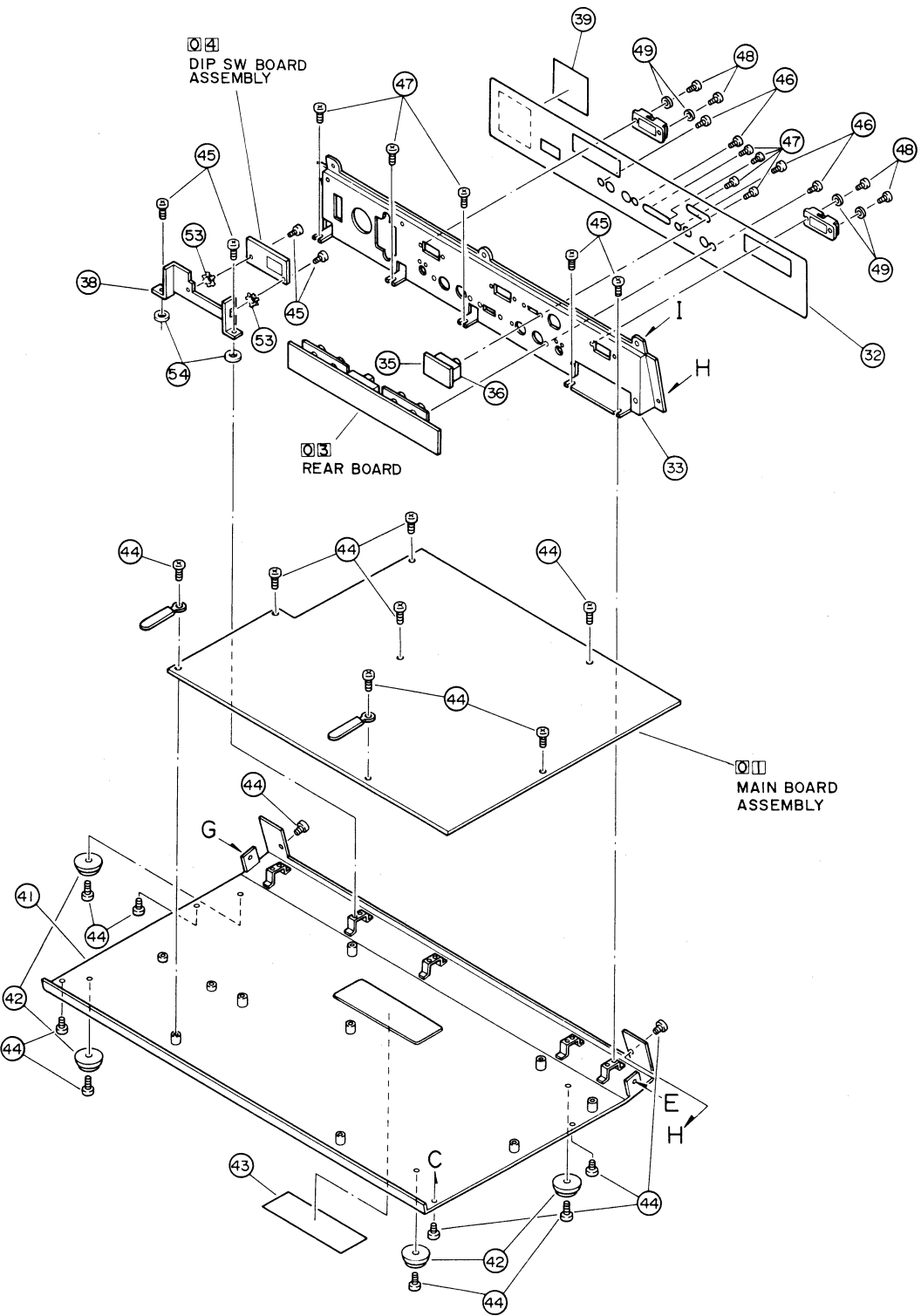
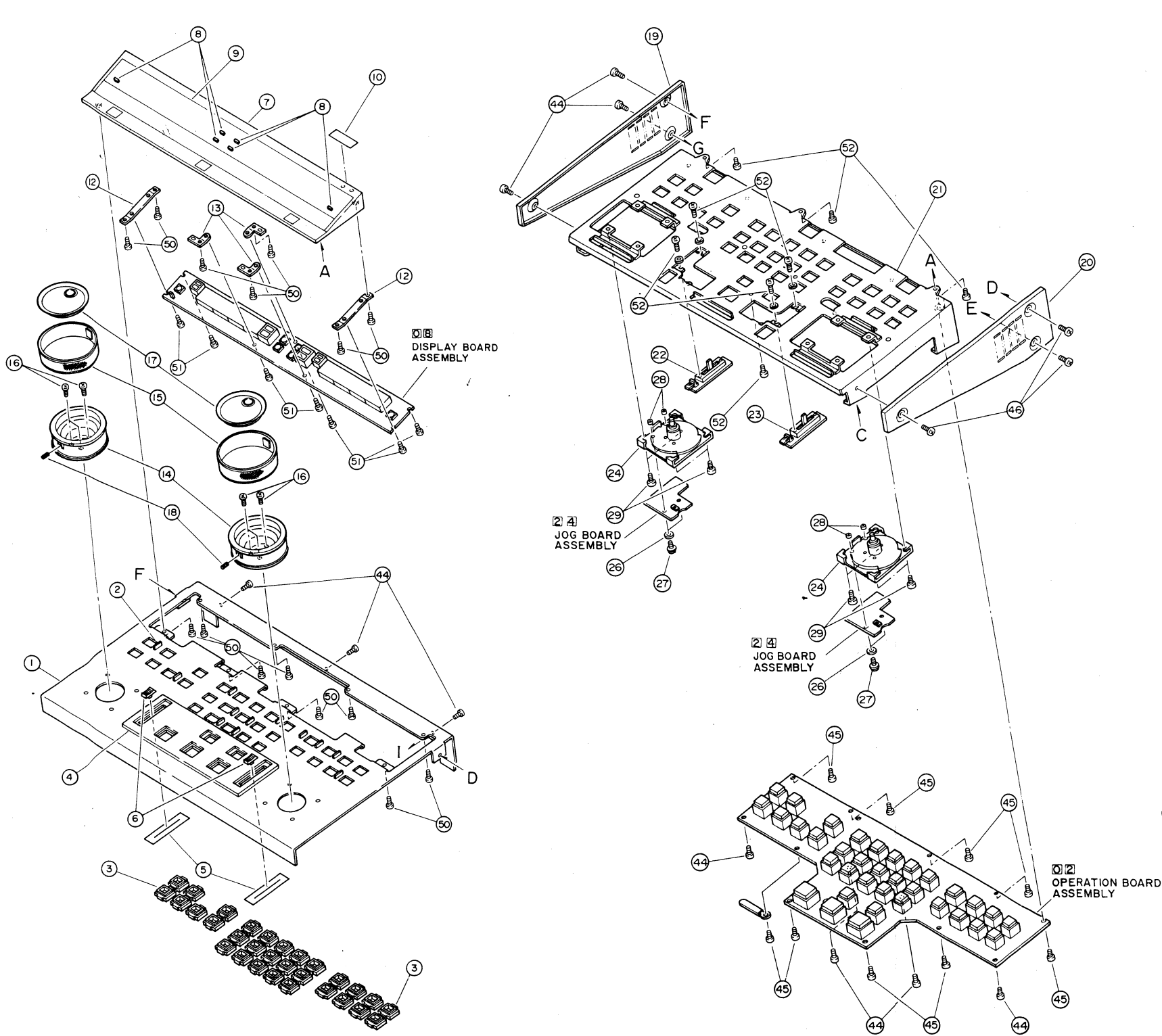


#	⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION

* PACKING <M1> *

1	QPGA060-05005	POLY BAG
2	PGD20094-1	CUSHION(R)
3	PGD20094-2	CUSHION(L)
4	PGD20095-05	PACKING CASE
5	PU45574C	CABLE, X2
6	QPGA040-05005	POLY BAG, X2
⚠ 7	PGD30002-130	INSTRUCTIONS(FOR PAL)
⚠ 8	PGD30002-113	INSTRUCTIONS(FOR NTSC)
8	QPGB024-03404	POLY BAG
9	BT-20046C	TOLL FREE CARD(FOR NTSC)
10	BT-20109	WARRANTY CARD(FOR NTSC)
11	PU54821	POLY BAG(FOR NTSC)

4.2 CHASSIS ASSEMBLY



#	REF NO.	PART NO.	PART NAME, DESCRIPTION

* CHASSIS ASSEMBLY <M2> *			

1		PGD10060B-05	TOP COVER ASSY
2		PGD40027	KNOB GUARD, X12
3		PGD40298	BUTTON GUIDE, X30
4		PGD20086-01-02	ESCUTCHEON
5		PU48692	SHEET, X2
6		PGD40299	VOL.KNOB, X2
7		PGD10064-05	FRONT PANEL
8		PU50507-1-1	COUNTER KNOB, X6
9		PGD20090-02	WINDOW
10		PGD30011-2	JVC MARK
12		PGD40293	PWB BRACKET(A), X2
13		PGD40294	PWB BRACKET(B), X3
14		PRD30196	SEARCH KNOB, X2
15		PRD41818	TIRE, X2
16		DPSP2006Z	SCREW, X6
17		PRD41819A	JOG KNOB ASSY, X2
18		YWS3004B	SET SCREW, X2
19		PGD20087-01-01	SIDE COVER(L)
20		PGD20088-01-01	SIDE COVER(R)
21		PGD10065B	MAIN CHASSIS ASSY
22		PGZ00084-020	SLIDE VOLUM ASSEMBLY(P)
23		PGZ00084-019	SLIDE VOLUM ASSEMBLY(R)
24		PGS20128G-02	SEARCH/JOG CONTROL ASSY
26		Q03093-829	WASHER, X4
27		DPSP2006Z	SCREW, X4
28		PRD42208	SPACER, X4
29		SPSP3008Z	SCREW, X8
32		PGD20214-02	CONNECTOR SHEET(FOR PAL)
		PGD20214-01-02	CONNECTOR SHEET(FOR NTSC)
33		PGD20089-02	REAR BRACKET
35		PGE40048-02	FRAME SELECT SW BOARD
36		QSS2201-004	SLIDE SWITCH
38		PGD30457	PWB BRACKET
39		PGD40925	LABEL
41		PGD10062B	BOTTOM COVER ASSY
42		QZF2207-001	FOOT, X4
△ 43		PGD30006-48	SERIAL NO.PLATE(FOR NTSC)
△ 43		PGD30006-57	SERIAL NO PLATE(FOR PAL)
44		SDBP3006N	SCREW, X30
45		SPST3006Z	SCREW, X16
46		SDBP3006M	SCREW, X4
47		SDBP2004M	SCREW, X4
48		SPSP2610Z	SCREW, X4
49		WAS2000Z	WASHER, X4
50		SPSA3008Z	SCREW, X16
51		SDBP2006M	SCREW, X7
52		NDBP2004N	SCREW
53		WBS3000N	WASHER, X2
54		WNB3000N	WASHER, X2

SECTION 5

ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the  symbol are critical for safety. Replace only with specified parts numbers.

#	REF NO.	PART NO.	PART NAME, DESCRIPTION

* 5.1 MAIN BOARD ASSEMBLY <01> *			

PWBA	PGZ00880-010	MAIN BOARD ASSEMBLY	
IC1	TMP284C00AP	IC	
IC2	PGZ00084-028-9	IC	
IC3	UPD446C-2	IC	
IC4	M74HC138P	IC	
IC5	M74HC139P	IC	
IC6	M74HC14P	IC	
IC7	M74HC74P	IC	
IC8	M74HC32P	IC	
IC9	HD14011B	IC	
IC10	HD14073B	IC	
IC11	M5M82C55AP-2	IC	
IC12	M50782SP	IC	
IC13	PGD30450-1-3	IC	
IC14	VC2054	IC	
IC15	VC2054	IC	
IC16	HD14520B	IC	
IC17	BA618	IC	
IC18	M54519P	IC	
IC19	M54519P	IC	
IC20	HD14011B	IC	
IC21	HD14078B	IC	
IC22	HD14078B	IC	
IC23	HD14078B	IC	
IC24	HD14069UB	IC	
IC25	HD14069UB	IC	
IC26	HD14069UB	IC	
IC27	HD14069UB	IC	
IC28	TMP82C55AN-2	IC	
IC29	TMP82C55AN-2	IC	
IC30	TMP82C55AN-2	IC	
IC31	M54519P	IC	
IC32	HD14066B	IC	
IC33	M54519P	IC	
IC34	M54519P	IC	
IC35	M54519P	IC	
IC36	HD14078B	IC	
IC38	HD14081B	IC	
IC40	HD14013B	IC	
IC41	M54519P	IC	
IC42	HD14069UB	IC	
IC43	HD14069UB	IC	
IC44	HD14069UB	IC	
IC45	HD14069UB	IC	
IC46	HD14069UB	IC	
IC47	HD14069UB	IC	
IC48	HD14069UB	IC	
IC49	HD14069UB	IC	
IC50	HD14078B	IC	
IC51	HD14066B	IC	
IC52	M54519P	IC	
IC53	M54519P	IC	
IC54	HD14066B	IC	
IC55	HD14066B	IC	
IC56	M54519P	IC	
IC57	M54519P	IC	
IC58	M54519P	IC	
IC59	HD14001B	IC	
IC60	BA222	IC	
IC61	M54519P	IC	
IC62	M54519P	IC	
IC63	UPD7564CS-088	IC	
IC64	UPD7564CS-088	IC	
IC65	HD14051B	IC	
IC66	HD14051B	IC	
IC67	UPC358C	IC	
IC68	UPC358C	IC	
IC69	M54533P	IC	
IC70	M51958BL	IC	
Q2	DTA124EF	TRANSISTOR	
Q4	DTC124EF	TRANSISTOR	
Q5	DTA124EF	TRANSISTOR	
Q6	DTA124EF	TRANSISTOR	
Q7	2SD636Q	TRANSISTOR	
Q8	2SD636Q	TRANSISTOR	
Q9	DTC124EF	TRANSISTOR	

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
D1	1SS133	DIODE	
D2	1SS133	DIODE	
D4	1SS133	DIODE	
D5	1SS133	DIODE	
D6	RD10EB2	ZENER DIODE	
D8	1SS133	DIODE	
D9	1SS133	DIODE	
D10	1SS133	DIODE	
D11	1SS133	DIODE	
D12	1SS133	DIODE	
D13	1SS133	DIODE	
D14	1SS133	DIODE	
D15	1SS133	DIODE	
D16	1SS133	DIODE	
D17	1SS133	DIODE	
D18	1SS133	DIODE	
D19	1SS133	DIODE	
D20	1SS133	DIODE	
D21	1SS133	DIODE	
D22	1SS133	DIODE	
D23	1SS133	DIODE	
D24	1SS133	DIODE	
D25	PK44LF-K5	DIODE	
D26	RK44LF-K5	DIODE	
D27	1SS133	DIODE	
D28	1SS133	DIODE	
D29	1SS133	DIODE	
D30	1SS133	DIODE	
D31	1SS133	DIODE	
D32	1SS133	DIODE	
D33	1SS133	DIODE	
D34	1SS133	DIODE	
D35	1SS133	DIODE	
D36	1SS133	DIODE	
D37	1SS133	DIODE	
D38	1SS133	DIODE	
D39	1SS133	DIODE	
D40	1SS133	DIODE	
D41	1SS133	DIODE	
D42	1SS133	DIODE	
D43	1SS133	DIODE	
D44	1SS133	DIODE	
D45	1SS133	DIODE	
D46	RD7.5EB2	ZENER DIODE	
D47	1SS133	DIODE	
D48	1SS133	DIODE	
D49	1SS133	DIODE	
D50	1SS133	DIODE	
D51	1SS133	DIODE	
D52	1SS133	DIODE	
D53	1SS133	DIODE	
D54	RD10EB2	ZENER DIODE	
D56	1SS133	DIODE	
D57	RD7.5EB2	ZENER DIODE	
D58	1SS133	DIODE	
D59	1SS133	DIODE	
D60	1SS133	DIODE	
D61	1SS133	DIODE	
D62	1SS133	DIODE	
D63	1SS133	DIODE	
D64	1SS133	DIODE	
D65	1SS133	DIODE	
D66	1SS133	DIODE	
D67	1SS133	DIODE	
D68	1SS133	DIODE	
D69	1SS133	DIODE	
D70	1SS133	DIODE	
D71	1SS133	DIODE	
D72	1SS133	DIODE	
D73	1SS133	DIODE	
D74	1SS133	DIODE	
DA1	DAN801	DIODE ARRAY	
DA2	DAP801	DIODE ARRAY	
DA3	DAN801	DIODE ARRAY	
DA4	DAP801	DIODE ARRAY	
DA5	DAN601	DIODE ARRAY	
DA6	DAP601	DIODE ARRAY	
DA7	DAN801	DIODE ARRAY	
DA8	DAP801	DIODE ARRAY	
DA9	DAN401	DIODE ARRAY	
DA10	DAP401	DIODE ARRAY	

#A	REF NO.	PART NO.	PART NAME, DESCRIPTION	#A	REF NO.	PART NO.	PART NAME, DESCRIPTION
DA11	DAN801		DIODE ARRAY	R67	QRD161J-473		RESISTOR
DA12	DAP801		DIODE ARRAY	R68	QRD161J-102		RESISTOR
DA13	DAN401		DIODE ARRAY	R69	QVP4A0B-332		V RESISTOR
DA14	DAP401		DIODE ARRAY	R70	QRD161J-103		RESISTOR
DA15	DAN801		DIODE ARRAY				
DA16	DAP801		DIODE ARRAY	R71	QRV143F-1302		RESISTOR
DA17	DAN601		DIODE ARRAY	R72	QRD161J-822		RESISTOR
DA18	DAP601		DIODE ARRAY	R73	QRD161J-333		RESISTOR
DA19	DA203		DIODE ARRAY	R74	QRD161J-104		RESISTOR
DA20	DA203		DIODE ARRAY	R75	QRV143F-1102		RESISTOR
				R76	QRD161J-682		RESISTOR
DA21	DA203		DIODE ARRAY	R77	QRD161J-392		RESISTOR
DA22	DA203		DIODE ARRAY	R78	QRD161J-472		RESISTOR
DA23	DA203		DIODE ARRAY	R79	QRD161J-562		RESISTOR
DA24	DA203		DIODE ARRAY	R80	QRD161J-334		RESISTOR
DA25	DA203		DIODE ARRAY				
DA26	DA203		DIODE ARRAY	R81	QRD161J-334		RESISTOR
				R82	QRD161J-334		RESISTOR
R1	QRD161J-105		RESISTOR	R83	QRD161J-104		RESISTOR
R2	QRD161J-472		RESISTOR	R84	QRD161J-472		RESISTOR
R3	QRD161J-103		RESISTOR	R85	QRD161J-104		RESISTOR
R4	QRD161J-333		RESISTOR	R86	QRD161J-823		RESISTOR
R5	QRD161J-0R0		RESISTOR	R87	QRD161J-823		RESISTOR
R6	QRD161J-0R0		RESISTOR	R88	QRD161J-823		RESISTOR
R7	QRD161J-471		RESISTOR	R89	QRD161J-823		RESISTOR
R8	QRD161J-334		RESISTOR	R90	QRD161J-334		RESISTOR
R9	QRD161J-334		RESISTOR				
R10	QRD161J-334		RESISTOR	R91	QRD161J-823		RESISTOR
				R92	QRD161J-823		RESISTOR
R11	QRD161J-221		RESISTOR	R93	QRD161J-101		RESISTOR
R12	QRD161J-221		RESISTOR	R94	QRD161J-101		RESISTOR
R13	QRD161J-221		RESISTOR	R95	QRD161J-103		RESISTOR
R14	QRD161J-221		RESISTOR	R97	QRD161J-101		RESISTOR
R15	QRD121J-680		RESISTOR	R98	QRD161J-104		RESISTOR
R16	QRD121J-680		RESISTOR	R99	QRD161J-473		RESISTOR
R17	QRD121J-680		RESISTOR	R100	QVP4A0B-472		V RESISTOR
R18	QRD121J-680		RESISTOR				
R19	QRD121J-680		RESISTOR	R101	QRD161J-331		RESISTOR
R20	QRD121J-680		RESISTOR	R102	QRD161J-222		RESISTOR
				R103	QRD161J-334		RESISTOR
R21	QRD121J-680		RESISTOR	R104	QRD161J-122		RESISTOR
R22	QRD121J-680		RESISTOR	R105	QRD161J-472		RESISTOR
R23	QRD161J-334		RESISTOR	R106	QRD161J-331		RESISTOR
R24	QRD161J-104		RESISTOR	R107	QRD161J-102		RESISTOR
R25	QRD161J-183		RESISTOR	R108	QRD161J-102		RESISTOR
R26	QRD161J-823		RESISTOR	R109	QRD161J-473		RESISTOR
R27	QRD161J-823		RESISTOR	R110	QRD161J-473		RESISTOR
R28	QRD161J-334		RESISTOR				
R29	QRD161J-101		RESISTOR	R111	QRD161J-103		RESISTOR
R30	QRD161J-823		RESISTOR	R112	QVP4A0B-332		V RESISTOR
				R113	QRD161J-822		RESISTOR
R31	QRD161J-101		RESISTOR	R114	QRD161J-333		RESISTOR
R32	QRD161J-103		RESISTOR	R115	QRD161J-104		RESISTOR
R33	QRD161J-101		RESISTOR	R116	QRV143F-1102		CMF RESISTOR
R34	QRD161J-103		RESISTOR	R117	QRV143F-1302		CMF RESISTOR
R35	QRD161J-823		RESISTOR	R118	QRD161J-562		RESISTOR
R36	QRD161J-823		RESISTOR	R119	QRD161J-472		RESISTOR
R37	QRD161J-334		RESISTOR	R120	QRD161J-392		RESISTOR
R38	QRD161J-153		RESISTOR				
R39	QRD161J-153		RESISTOR	R121	QRD161J-682		RESISTOR
R40	QRD161J-393		RESISTOR	R122	QRD161J-334		RESISTOR
				R123	QRD161J-334		RESISTOR
R41	QRD161J-393		RESISTOR	R124	QRD161J-334		RESISTOR
R42	QRD161J-222		RESISTOR	R125	QRD161J-104		RESISTOR
R43	QRD161J-393		RESISTOR	R126	QRD161J-102		RESISTOR
R44	QRD161J-393		RESISTOR	R127	QRD161J-102		RESISTOR
R45	QRD161J-153		RESISTOR	R128	QRD161J-102		RESISTOR
R46	QRD161J-153		RESISTOR	R129	QRD161J-102		RESISTOR
R47	QRD161J-102		RESISTOR	R130	QRD161J-102		RESISTOR
R48	QRD161J-102		RESISTOR				
R49	QRD161J-102		RESISTOR	R131	QRD161J-334		RESISTOR
R50	QRD161J-102		RESISTOR	R132	QRD161J-153		RESISTOR
				R133	QRD161J-153		RESISTOR
R51	QRD161J-102		RESISTOR	R134	QRD161J-334		RESISTOR
R52	QRD161J-334		RESISTOR	R135	QRD161J-334		RESISTOR
R53	QRD161J-334		RESISTOR	R136	QRD161J-334		RESISTOR
R54	QRD161J-334		RESISTOR	R137	QRD161J-334		RESISTOR
R55	QRD161J-222		RESISTOR	R138	QRD161J-823		RESISTOR
R56	QRD161J-222		RESISTOR	R139	QRD161J-102		RESISTOR
R57	QRD161J-222		RESISTOR	R140	QRD161J-102		RESISTOR
R58	QRD161J-122		RESISTOR	R150	QRD161J-331		RESISTOR
R59	QRD161J-472		RESISTOR				
R60	QRD161J-823		RESISTOR	R151	QRD161J-331		RESISTOR
				R152	QRD161J-103		RESISTOR
R61	QRD161J-823		RESISTOR	R153	QRD161J-223		RESISTOR
R62	QVP4A0B-332		V RESISTOR	R154	QRD161J-472		RESISTOR
R63	QVP4A0B-332		V RESISTOR	R155	QRD161J-472		RESISTOR
R64	QRD161J-331		RESISTOR				
R65	QRD161J-102		RESISTOR	RA1	EXB-P84474M		RESISTOR ARRAY
R66	QRD161J-473		RESISTOR	RA2	EXB-P88334M		RESISTOR ARRAY

#▲ REF NO.	PART NO.	PART NAME, DESCRIPTION	#▲ REF NO.	PART NO.	PART NAME, DESCRIPTION
RA3	EXB-P85104M	RESISTOR ARRAY	C61	QCS11HJ-101	CAPACITOR
RA4	EXB-P88104M	RESISTOR ARRAY	C63	QETA1HM-105	E CAPACITOR
RA5	EXB-P85104M	RESISTOR ARRAY	C64	QETA1CM-336	E CAPACITOR
RA6	EXB-P88334M	RESISTOR ARRAY	C65	QETA1CM-336	E CAPACITOR
RA7	EXB-P88334M	RESISTOR ARRAY	C66	QETA1HM-105	E CAPACITOR
RA8	EXB-P88334M	RESISTOR ARRAY	C67	QCS11HJ-101	CAPACITOR
RA9	EXB-RB8472J	RESISTOR ARRAY	C68	QCS11HJ-101	CAPACITOR
RA10	EXB-RB8472J	RESISTOR ARRAY	C70	QFN41HJ-103	M CAPACITOR
RA11	EXB-RB8472J	RESISTOR ARRAY	C81	QFN41HJ-222	M CAPACITOR
RA12	EXB-P84104M	RESISTOR ARRAY	C86	QEN40JM-108	E CAPACITOR
RA13	EXB-P85474M	RESISTOR ARRAY	C92	QFN41HJ-223	M CAPACITOR
RA14	EXB-P88334M	RESISTOR ARRAY	C93	QEN41HM-106	E CAPACITOR
RA15	EXB-P88223M	RESISTOR ARRAY	C97	QFN41HJ-222	M CAPACITOR
RA16	EXB-P88334M	RESISTOR ARRAY	C106	QEN41HM-106	E CAPACITOR
RA17	EXB-P84222M	RESISTOR ARRAY	C107	QFN41HJ-222	M CAPACITOR
RA18	EXB-P84104M	RESISTOR ARRAY	C110	QFN41HJ-222	M CAPACITOR
RA19	EXB-P88223M	RESISTOR ARRAY	C122	QEN40JM-108	E CAPACITOR
RA20	EXB-P85474M	RESISTOR ARRAY	C150	QFN41HJ-223	M CAPACITOR
RA21	EXB-P84153M	RESISTOR ARRAY	C151	QFN41HJ-223	M CAPACITOR
RA22	EXB-P84153M	RESISTOR ARRAY	C152	QFN41HJ-223	M CAPACITOR
RA23	EXB-P84153M	RESISTOR ARRAY	C153	QFN41HJ-223	M CAPACITOR
RA24	EXB-P84153M	RESISTOR ARRAY	C154	QFN41HJ-223	M CAPACITOR
RA25	EXB-P85474M	RESISTOR ARRAY	C155	QFN41HJ-223	M CAPACITOR
RA26	EXB-P84334M	RESISTOR ARRAY	C156	QETA1HM-335	E CAPACITOR
C1	QCS11HJ-330	CAPACITOR	C157	QETA1HM-335	E CAPACITOR
C2	QCS11HJ-330	CAPACITOR	C158	QCS11HJ-560	CAPACITOR
C3	QFN41HJ-683	M CAPACITOR	CF1	PGZ00883	CERAMIC FILTER
C4	QFN41HJ-333	M CAPACITOR	CF2	PGZ00758	CERAMIC FILTER
C5	QFN41HJ-103	M CAPACITOR	▲ CF3	PU50224	RESONATOR, X2
C6	QCS11HJ-101	CAPACITOR	▲ CF4	PU50224	CERAMIC FILTER
C7	QCS11HJ-330	CAPACITOR	SW2	QSS1K41-L01	DIP SW2
C8	QCS11HJ-330	CAPACITOR	DD1	PGZ00931	DC/DC CONV.
C9	QEN41CM-226	NP CAPACITOR	DD2	PGZ00931	DC/DC CONV.
C10	QFN41HJ-223	M CAPACITOR	HD1	PU51212	FUSE CLIP, X4
C11	QFN41HJ-223	M CAPACITOR	SKT1	PGZ00331-028	IC SOCKET
C12	QFN41HJ-223	M CAPACITOR	▲ VA1	PU49624-2	VARISTOR(VA1,2)
C13	QFN41HJ-223	M CAPACITOR	TP1	PGZ00880-005	TEST PIN (TP8-11)
C14	QFN41HJ-223	M CAPACITOR	CN1	PU58844-6	CONNECTOR
C15	QFN41HJ-223	M CAPACITOR	CN2	PU58844-8	CONNECTOR
C16	QFN41HJ-223	M CAPACITOR	CN3	PU58844-12	CONNECTOR
C17	QFN41HJ-223	M CAPACITOR	CN4	PU58844-7	CONNECTOR
C18	QFN41HJ-223	M CAPACITOR	CN5	PU58844-5	CONNECTOR
C19	QFN41HJ-223	M CAPACITOR	CN6	PU58844-8	CONNECTOR
C20	QFN41HJ-223	M CAPACITOR	CN7	PU58844-8	CONNECTOR
C21	QFN41HJ-223	M CAPACITOR	CN8	PU58844-5	CONNECTOR
C22	QFN41HJ-223	M CAPACITOR	CN9	PU58844-6	CONNECTOR
C23	QFN41HJ-223	M CAPACITOR	CN10	PU58844-8	CONNECTOR
C24	QFN41HJ-223	M CAPACITOR	CN11	PU58844-8	CONNECTOR
C25	QFN41HJ-223	M CAPACITOR	CN12	PU58844-12	CONNECTOR
C26	QFN41HJ-223	M CAPACITOR	CN13	PU58844-9	CONNECTOR
C27	QFN41HJ-223	M CAPACITOR	CN14	PU58844-8	CONNECTOR
C28	QFN41HJ-103	M CAPACITOR	CN15	PU58844-10	CONNECTOR
C29	QFN41HJ-103	M CAPACITOR	CN16	PU58844-10	CONNECTOR
C30	QFN41HJ-103	M CAPACITOR	CN17	PU58844-9	CONNECTOR
C31	QFN41HJ-103	M CAPACITOR	CN18	PU58844-9	CONNECTOR
C32	QFN41HJ-103	M CAPACITOR	CN19	PU58844-8	CONNECTOR
C33	QETA1CM-336	E CAPACITOR	CN20	PU58844-8	CONNECTOR
C34	QETA1CM-336	E CAPACITOR	CN21	PU58844-10	CONNECTOR
C36	QETA1CM-228	E CAPACITOR	CN22	PU58844-5	CONNECTOR
C37	QETA1AM-108	E CAPACITOR	CN23	PU58844-5	CONNECTOR
C38	QFN41HJ-223	M CAPACITOR	CN24	PU58844-9	CONNECTOR
C39	QEN41HM-474	NP E CAPACITOR	CN25	PU58844-8	CONNECTOR
C40	QEN41HM-474	NP E CAPACITOR	CN26	PU58844-2	CONNECTOR
C41	QFN41HJ-223	M CAPACITOR	BZ1	PGZ00084-026	BUZZER
C42	QFN41HJ-223	M CAPACITOR	▲ F1	QMF51E2-1R0	FUSE, NOT INCL B.ASSY(PA,)
C43	QFN41HJ-223	M CAPACITOR	▲ F2	QMF51U1-1R0	FUSE, NOT INCL B.ASSY(NT, C)
C44	QFN41HJ-103	M CAPACITOR	▲ F2	QMF51E2-1R0	FUSE, NOT INCL B.ASSY(PA,)
C45	QFN41HJ-103	M CAPACITOR	▲ F2	QMF51U1-1R0	FUSE, NOT INCL B.ASSY(NT, C)
C47	QETA1CM-228	E CAPACITOR			
C48	QETA1AM-108	E CAPACITOR			
C49	QFN41HJ-223	M CAPACITOR			
C50	QEN41HM-474	NP E CAPACITOR			
C51	QEN41HM-474	NP E CAPACITOR			
C52	QFN41HJ-223	M CAPACITOR			
C53	QFN41HJ-223	M CAPACITOR			
C54	QFN41HJ-223	M CAPACITOR			
C55	QFN41HJ-223	M CAPACITOR			
C56	QFN41HJ-103	M CAPACITOR			
C57	QFN41HJ-103	M CAPACITOR			
C58	QETA1CM-226	E CAPACITOR			
C59	QETA1CM-226	E CAPACITOR			
C60	QCS11HJ-101	CAPACITOR			

#△ REF NO. PART NO. PART NAME, DESCRIPTION

* 5.2 OPERATION BOARD ASSEMBLY <02> *

PWBA PGZ00880-011 OPERATION BOARD ASSEMBLY

Q1 2SB644S TRANSISTOR
Q2 2SB644S TRANSISTOR
Q3 2SB644S TRANSISTOR
Q4 2SB644S TRANSISTOR
Q5 2SB644S TRANSISTOR
Q6 2SB644S TRANSISTOR
Q7 2SB644S TRANSISTOR
Q8 2SB644S TRANSISTOR
Q9 2SB644S TRANSISTOR
Q10 2SB644S TRANSISTOR

Q11 2SB644S TRANSISTOR

D1 1SS133 DIODE
D2 1SS133 DIODE
D3 1SS133 DIODE
D4 1SS133 DIODE
D5 1SS133 DIODE
D6 1SS133 DIODE
D7 1SS133 DIODE
D8 1SS133 DIODE
D9 1SS133 DIODE
D10 1SS133 DIODE

D11 1SS133 DIODE

R1 QRD161J-473 RESISTOR
R2 QRD161J-473 RESISTOR
R3 QRD161J-473 RESISTOR
R4 QRD161J-473 RESISTOR
R5 QRD161J-473 RESISTOR
R6 QRD161J-473 RESISTOR
R7 QRD161J-473 RESISTOR
R8 QRD161J-473 RESISTOR
R9 QRD161J-473 RESISTOR
R10 QRD161J-473 RESISTOR

R11 QRD161J-473 RESISTOR
R12 QRD161J-392 RESISTOR
R13 QRD161J-392 RESISTOR
R14 QRD161J-392 RESISTOR
R15 QRD161J-392 RESISTOR
R16 QRD161J-392 RESISTOR
R17 QRD161J-392 RESISTOR
R18 QRD161J-392 RESISTOR
R19 QRD161J-392 RESISTOR
R20 QRD161J-392 RESISTOR

R21 QRD161J-392 RESISTOR
R22 QRD161J-392 RESISTOR
R23 QRD161J-221 RESISTOR
R24 QRD161J-221 RESISTOR
R25 QRD161J-221 RESISTOR
R26 QRD161J-221 RESISTOR

R31 QRD161J-221 RESISTOR
R32 QRD161J-221 RESISTOR
R33 QRD161J-221 RESISTOR
R34 QRD161J-221 RESISTOR
R35 QRD161J-221 RESISTOR
R36 QRD161J-221 RESISTOR
R37 QRD161J-221 RESISTOR
R38 QRD161J-221 RESISTOR
R39 QRD161J-221 RESISTOR
R40 QRD161J-221 RESISTOR

C1 QER41EM-106 E CAPACITOR
C2 QER41EM-106 E CAPACITOR
C3 QER41EM-106 E CAPACITOR
C4 QER41EM-106 E CAPACITOR
C5 QER41EM-106 E CAPACITOR
C6 QER41EM-106 E CAPACITOR
C7 QER41EM-106 E CAPACITOR
C8 QER41EM-106 E CAPACITOR
C9 QER41EM-106 E CAPACITOR
C10 QER41EM-106 E CAPACITOR

C11 QER41EM-106 E CAPACITOR

#△ REF NO. PART NO. PART NAME, DESCRIPTION

S1 PGZ00155 PUSH SWITCH
S2 PGZ00155 PUSH SWITCH
S3 PGZ00155-7 PUSH SWITCH
S4 PGZ00155-6-1 PUSH SWITCH
S5 PGZ00155-8 PUSH SWITCH
S6 PGZ00155-2-1 PUSH SWITCH
S7 PGZ00155-2-1 PUSH SWITCH
S8 PGZ00155-9 PUSH SWITCH
S9 PGZ00155-8 PUSH SWITCH
S10 PGZ00155-2-1 PUSH SWITCH

S11 PGZ00155-2-1 PUSH SWITCH
S12 PGZ00155 PUSH SWITCH
S13 PGZ00155 PUSH SWITCH
S14 PGZ00155-7 PUSH SWITCH
S15 PGZ00155-6-1 PUSH SWITCH
S16 PGZ00155-5 PUSH SWITCH
S17 PGZ00155-4 PUSH SWITCH
S18 PGZ00155-4 PUSH SWITCH
S19 PGZ00155-10 PUSH SWITCH
S20 PGZ00155 PUSH SWITCH

S21 PGZ00155 PUSH SWITCH
S22 PGZ00155 PUSH SWITCH
S23 PGZ00155 PUSH SWITCH
S24 PGZ00155 PUSH SWITCH
S25 PGZ00155 PUSH SWITCH
S26 PGZ00155 PUSH SWITCH
S27 PGZ00155 PUSH SWITCH
S28 PGZ00155 PUSH SWITCH
S29 PGZ00155 PUSH SWITCH
S30 PGZ00155 PUSH SWITCH

S31 PGZ00155 PUSH SWITCH
S32 PGZ00155 PUSH SWITCH
S33 PGZ00156-6 PUSH SWITCH
S34 PGZ00156-7 PUSH SWITCH
S35 PGZ00156-6 PUSH SWITCH

LP1 PGZ00155-LAMP LAMP,X32
LP2 PGZ00156-LAMP LAMP,X3

* 5.3 REAR BOARD ASSEMBLY <03> *

PWB PGZ00284-3 REAR BOARD

PD1 PU49624-2 VARISTOR
PD4 PU49624-2 VARISTOR
PD5 PU49624-2 VARISTOR
PD8 PU49624-2 VARISTOR

SW1 QSS2301-003 SLIDE SWITCH

J1 PGZ00221-2 2P JACK ASSY, X2

* 5.4 DIP SW BOARD ASSEMBLY <04> *

PWBA PGZ00880-012 DIP SW BOARD ASSEMBLY

R1 QRD161J-103 RESISTOR
R2 QRD161J-103 RESISTOR
R3 QRD161J-103 RESISTOR
R4 QRD161J-103 RESISTOR
R5 QRD161J-331 RESISTOR
R6 QRD161J-332 RESISTOR
R7 QRD161J-331 RESISTOR
R8 QRD161J-332 RESISTOR
R9 QRD161J-331 RESISTOR
R10 QRD161J-331 RESISTOR

SW1 PU52746-108 DIP SWITCH

△ VA1 PU49624-2 VARISTOR
△ VA2 PU49624-2 VARISTOR
△ VA3 PU49624-2 VARISTOR
△ VA4 PU49624-2 VARISTOR
△ VA5 PU49624-2 VARISTOR
△ VA6 PU49624-2 VARISTOR

#△	REF NO.	PART NO.	PART NAME, DESCRIPTION
△	VA7	PU49624-2	VARISTOR
△	VA8	PU49624-2	VARISTOR
△	VA9	PU49624-2	VARISTOR
△	VA10	PU49624-2	VARISTOR

* 5.5 DISPLAY BOARD ASSEMBLY <08> *			

PWBA	PGZ00881A-02	DISPLAY BOARD ASSEMBLY	
IC1	TC74HC238F	IC	
IC2	TC74HC238F	IC	
IC3	TD62503F	IC	
IC4	TD62503F	IC	
IC5	TD62503F	IC	
D1	LD-001VR	LE DIODE	
D2	LD-001VR	LE DIODE	
D3	LD-603MG	LE DIODE	
D4	LD-603MG	LE DIODE	
D5	LD-001VR	LE DIODE	
D6	LD-001VR	LE DIODE	
D7	LD-603MG	LE DIODE	
D8	LD-603MG	LE DIODE	
D9	SLB-25MG	LE DIODE	
D10	SLB-25MG	LE DIODE	
D11	1SS133	DIODE	
D12	LB-602VK	LE DIODE	
D13	LB-602VK	LE DIODE	
D14	LB-602VK	LE DIODE	
D15	LB-602VK	LE DIODE	
D16	LB-602VK	LE DIODE	
D17	LB-602VK	LE DIODE	
D18	LB-602VK	LE DIODE	
D19	LB-602VK	LE DIODE	
R1	QRD167J-181	RESISTOR	
R2	QRD167J-181	RESISTOR	
R3	NRS016G-470N	RESISTOR	
R4	NRS016G-470N	RESISTOR	
R5	QRD167J-181	RESISTOR	
R6	QRD167J-181	RESISTOR	
R7	NRS016G-470N	RESISTOR	
R8	NRS016G-470N	RESISTOR	
R9	QRD167J-331	RESISTOR	
R10	QRD167J-331	RESISTOR	
R11	QRD167J-104	RESISTOR	
C1	QETC1HM-105	E CAPACITOR	
S1	PU49344	TACT SWITCH	
S2	PU49344	TACT SWITCH	
S3	PU49344	TACT SWITCH	
S4	PU49344	TACT SWITCH	
S5	PU49344	TACT SWITCH	
S6	PU49344	TACT SWITCH	
CN1	PU58844-6	CONNECTOR	
CN2	PU58844-8	CONNECTOR	
CN3	PU58844-12	CONNECTOR	
CN4	PU58844-7	CONNECTOR	
	PGZ00154-021	COVER CASE(1), X2	
	PGZ00154-022	PLASTIC FILTER, X2	
	PGZ00154-023	COVER CASE(2), X2	
	PGZ00154-024	PLASTIC FILTER, X2	

* 5.6 JOG BOARD ASSEMBLY <24> *

(PI)	GP2L04B	PHOTO SENSOR
PWBA	PGE30105A-02	JOG BOARD ASSEMBLY
IC1	TC4584BP	IC
R1	QRS188J-271YN	RESISTOR
R2	QRSA08J-122YN	RESISTOR
R3	QRS188J-271YN	RESISTOR

#△	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R4	QRSA08J-122YN	RESISTOR
	R5	QRSA08J-271YN	RESISTOR
	R6	QRSA08J-122YN	RESISTOR
	R7	QRSA08J-271YN	RESISTOR
	R8	QRSA08J-561YN	RESISTOR
	R9	QRSA08J-271YN	RESISTOR
	R10	QRSA08J-561YN	RESISTOR
	C1	QER41EM-475	E CAPACITOR
	C2	QCF11HP-103	CAPACITOR
	PHS1	GP2L04B	PHOTO SENSOR
	PHS2	GP2L04B	PHOTO SENSOR
	PHS3	GP2L04B	PHOTO SENSOR
	PHS4	GP2L04B	PHOTO SENSOR
	PHS5	GP2L04B	PHOTO SENSOR
	SPC1	PRD41774-01-01	SPACER
	CN1	PU58844-9	CAP HOUSING